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**CHARACTERIZATION OF THE SAND
ON
SELECTED MUNITION TEST SITES
AT
EGLIN AIR FORCE BASE, FLORIDA**

**DAMAGE MECHANISM BRANCH
TECHNOLOGY DIVISION**

TECHNICAL REPORT AFATL-TR-71-51

APRIL 1971

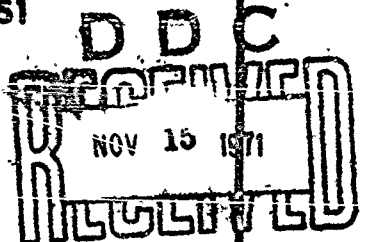
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EGLIN AIR FORCE BASE, FLORIDA



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**Characterization of the Sand
on
Selected Munition Test Sites
at
Eglin Air Force Base, Florida**

James C. Richardson

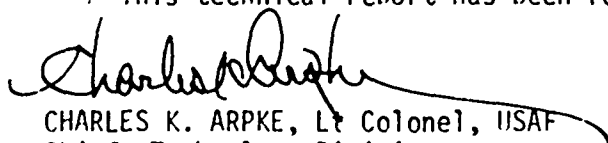
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FOREWORD

This report documents test activities performed under the auspices of the Degradation Effects Program (DEP) between June 1968 and May 1969. DEP consists of three working groups: Test and Data Acquisition (TDAWG), Methodology and Evaluation (MEWG), and Environmental Characterization (ECWG). Fuze function data obtained by TDAWG may be found in ADTC-TP-70-198 and PGOWQ-3 data to be published. Acknowledgement is extended to Mr J. Brown of the U. S. Army Engineers Waterways Experiment Station (WES) for his training and data gathering techniques and equipment usage, and to Mr R. F. Brandt and personnel of Range 22, all of DLRD, Eglin Air Force Base, Florida.

This technical report has been reviewed and is approved.


CHARLES K. ARPKE, Lt Colonel, USAF
Chief, Technology Division

ABSTRACT

Test data was obtained by Environmental Characterization Working Group from two sand test sites to determine how selected environmental factors affect fuze functioning. The sand is described in terms of density, percentage moisture, and penetrometer readings, and each of these was evaluated to determine its variability. Regression analysis tests were performed to determine if a relationship existed between the variables. The variables were first paired by test site and were then combined to learn if one of the variables could be predicted by knowing another. Linear correlation of the variables was also evaluated. The data is based on a controlled environment and the results should not be applied to other environments.

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SECTION I

DESCRIPTION OF TEST RANGES

Investigations into the effects of a sand environment on munitions were conducted on Test Area (TA) B-76 and TA C-72 on the Eglin Air Force Base Reservation. TA B-76 was the site for static arena tests and for testing small conventional and/or developmental, munition items that were delivered by a pneumatic air gun (avalauncher). TA C-72 was the locale for testing munition items used in dynamic, or air-delivered, tests.

TA B-76 is in the northwest section of the Eglin Reservation at latitude 30°35' north and longitude 86°52' west, lying in the Yellow River basin and bounded by Bear Creek and Boiling Creek. The test site elevation is 20.2 feet (Figures 1 and 2). The soil was brought in from a nearby sand pit, and the results of the soil analysis are found in Figures 3, 4, and 5.

TA C-72 is located in the northeast portion of the Eglin Reservation at latitude 30°38' north and longitude 86°19' west, and at a recorded elevation of 199 feet. The test site is located on the top of a hill and has a gentle downward slope to the northeast (Figures 6 and 7). Soil for these tests was insitu (its natural and original position). Analyses of these samples and their findings are presented in Table I and Figure 8.

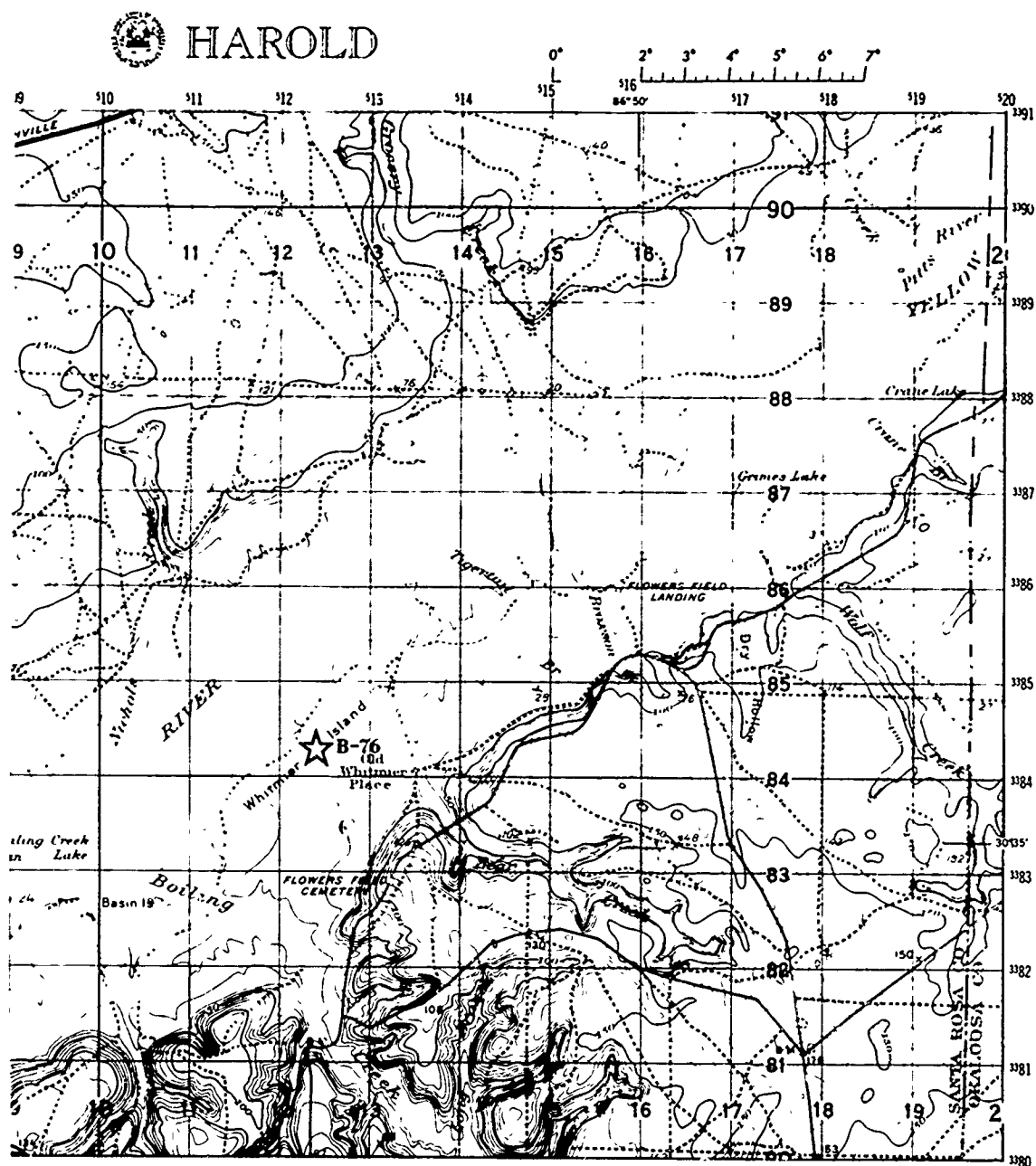


Figure 1. Map Showing Location of Test Area B-76

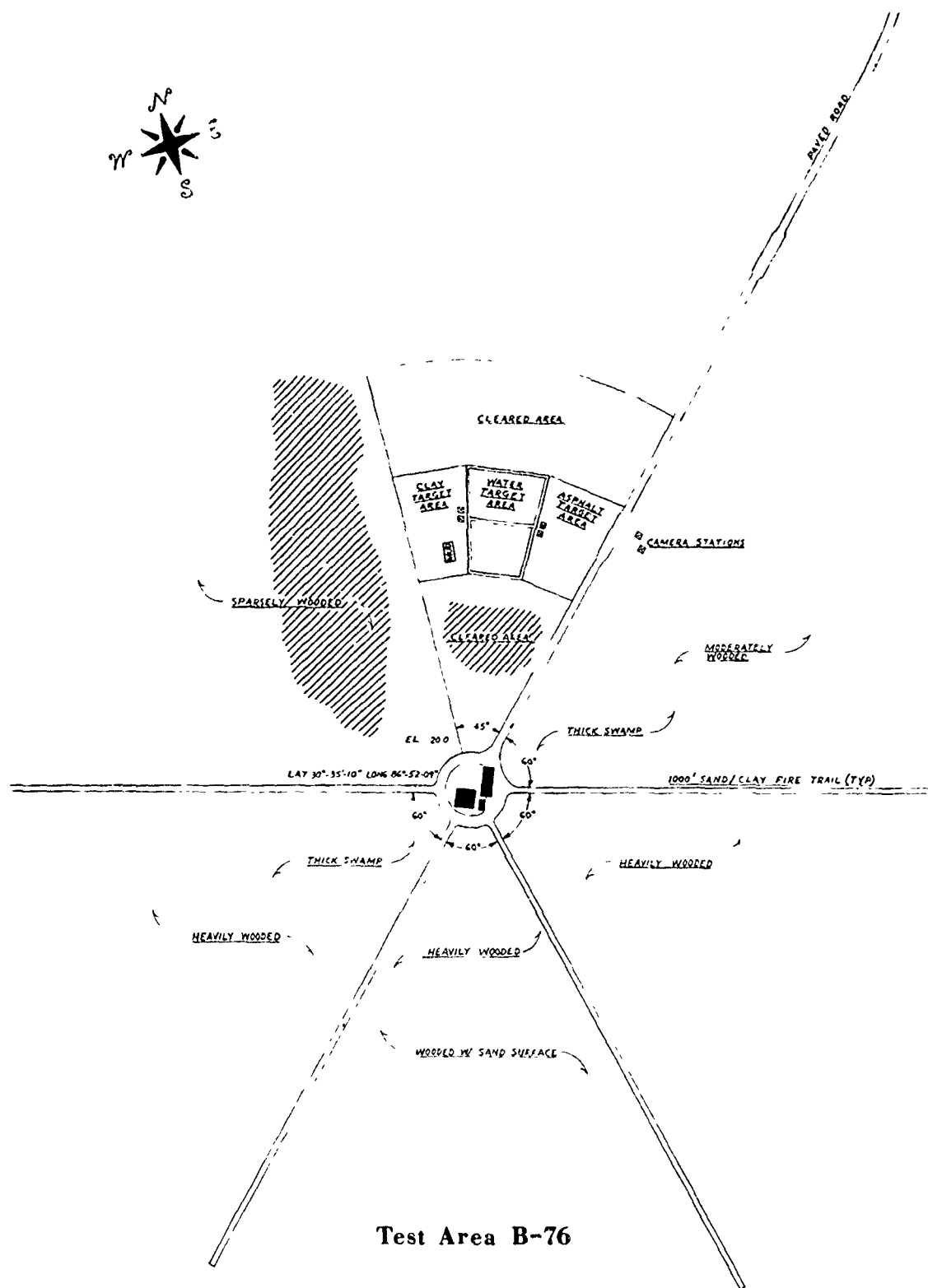


Figure 2. Sketch of Test Area B-76

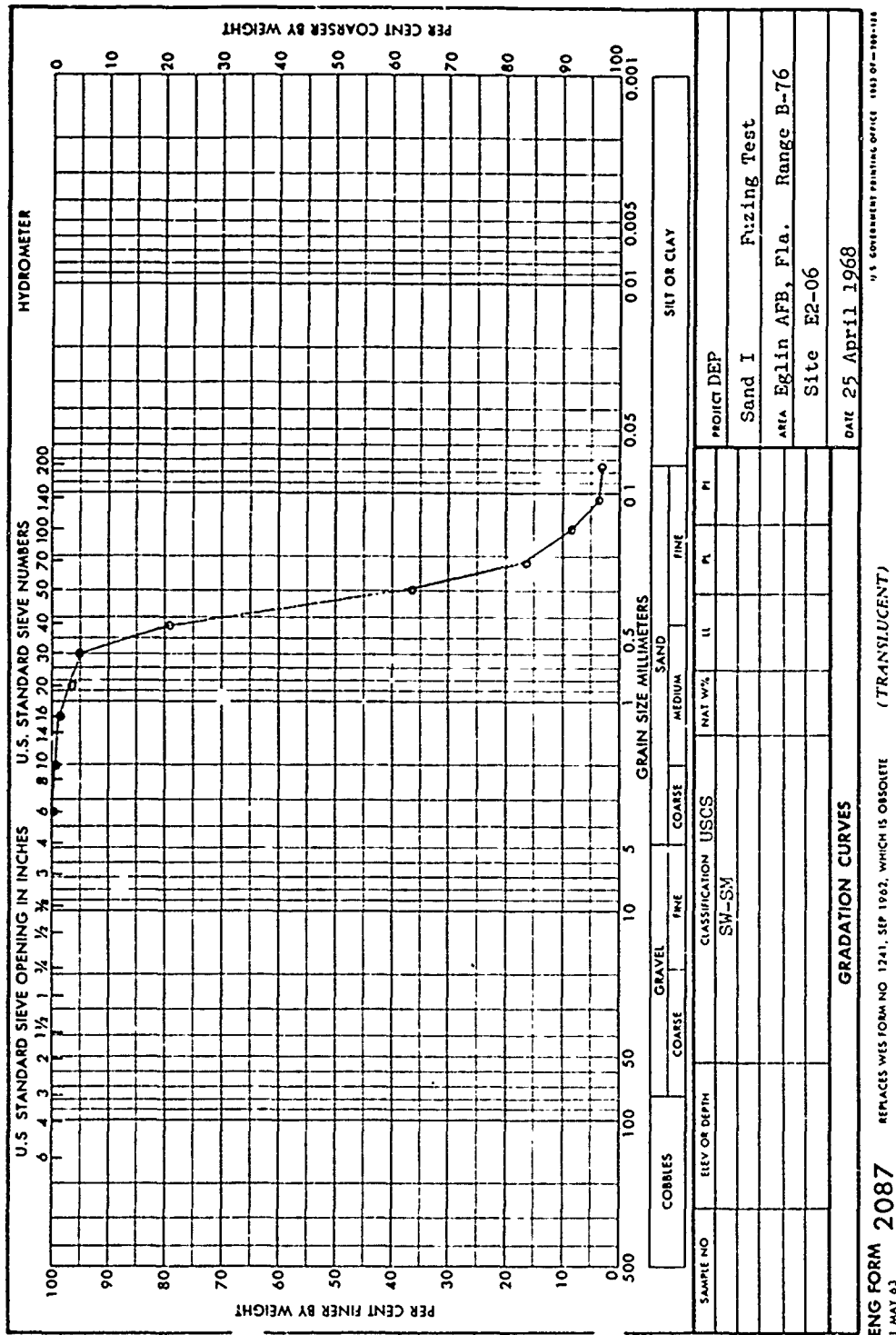
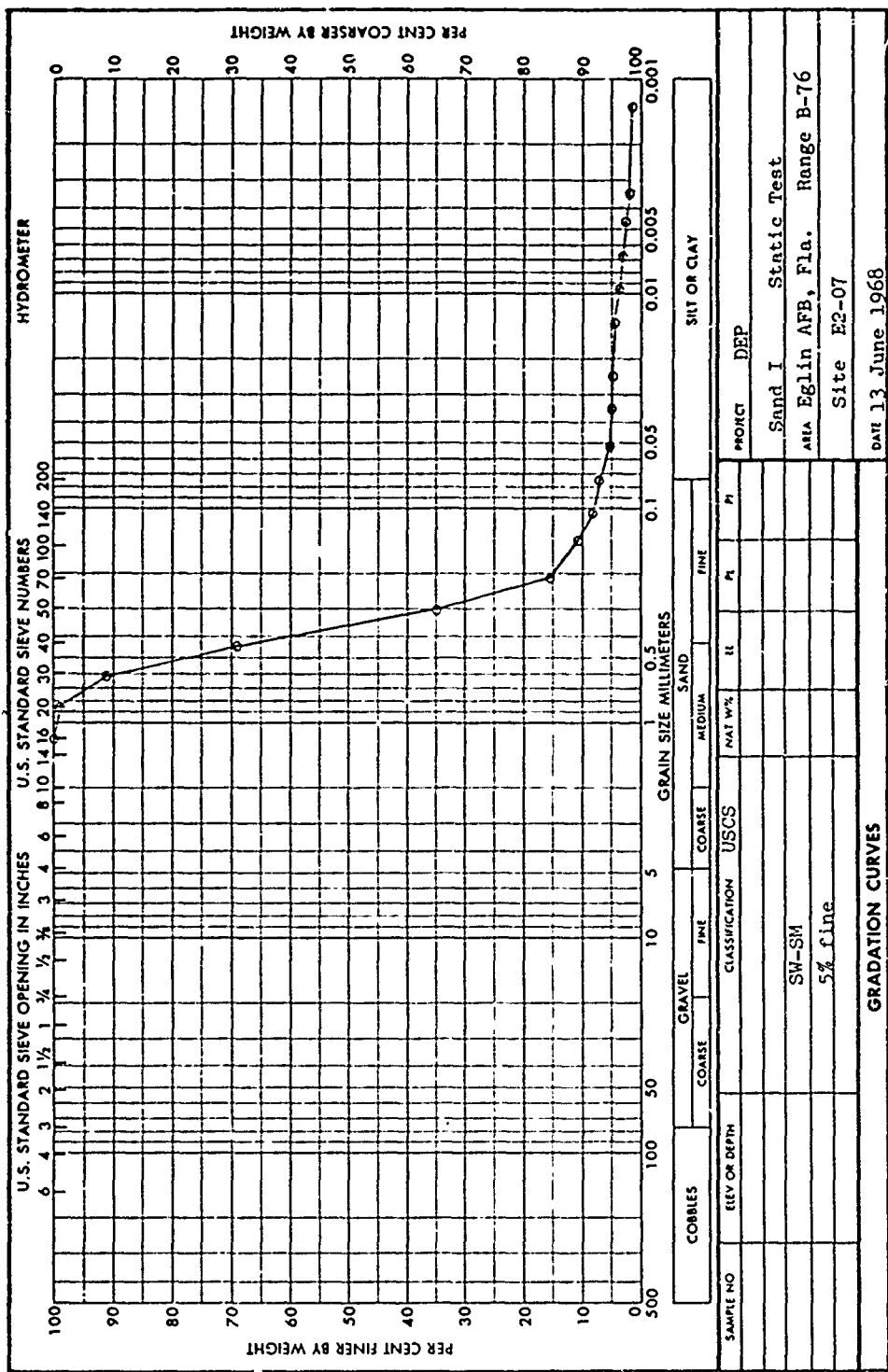


Figure 3. Analysis of Soil Samples from Fuzing Test at Test Area B-76



ENG FORM 2087 REPLACES WES FORM NO 1241, SEP 1962, WHICH IS OBSOLETE (TRANSLUCENT)

Figure 4. Analysis of Soil Samples from Static Test at Test Area B-76

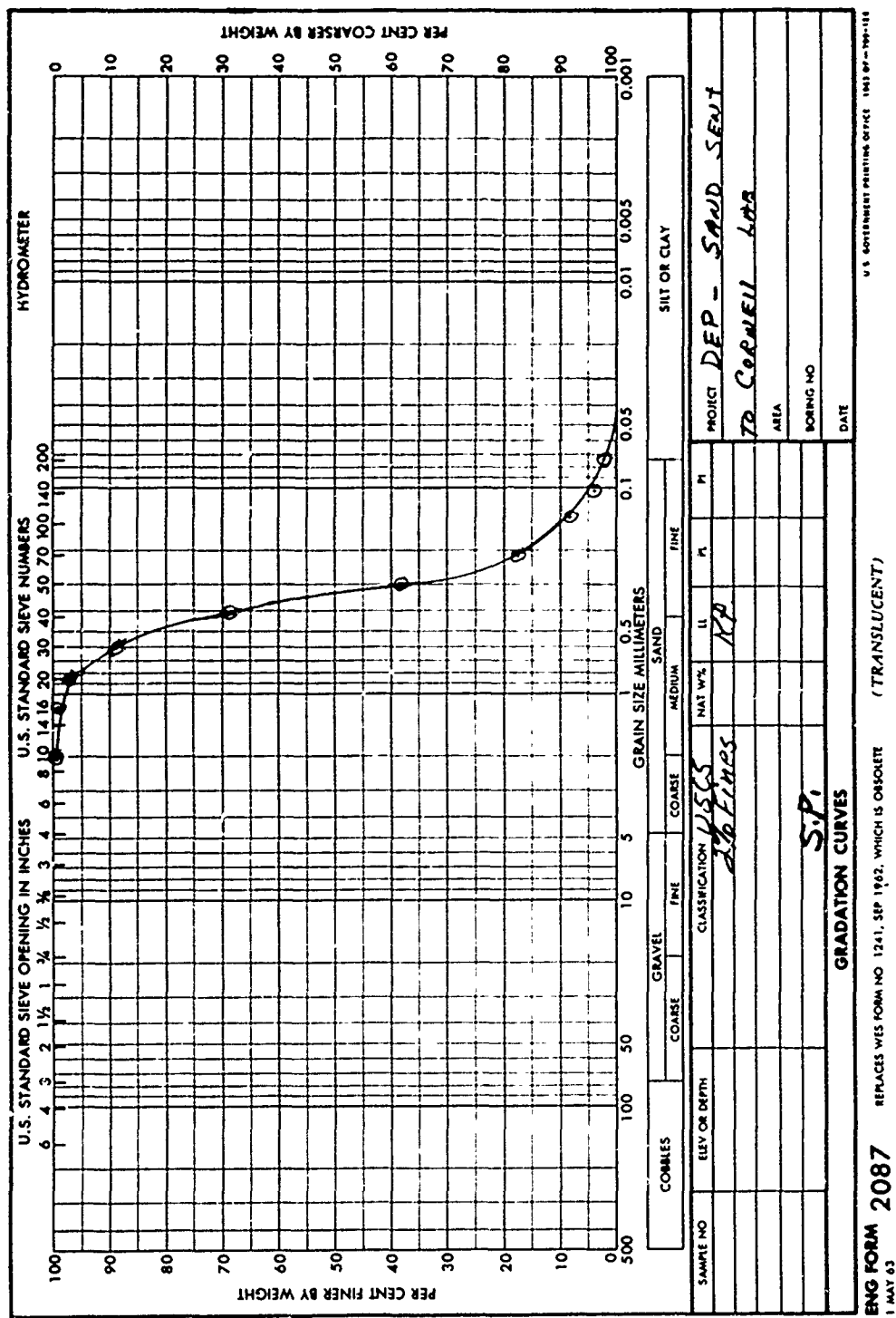


Figure 5. Analysis of Samples from Test Area B-76 Sand

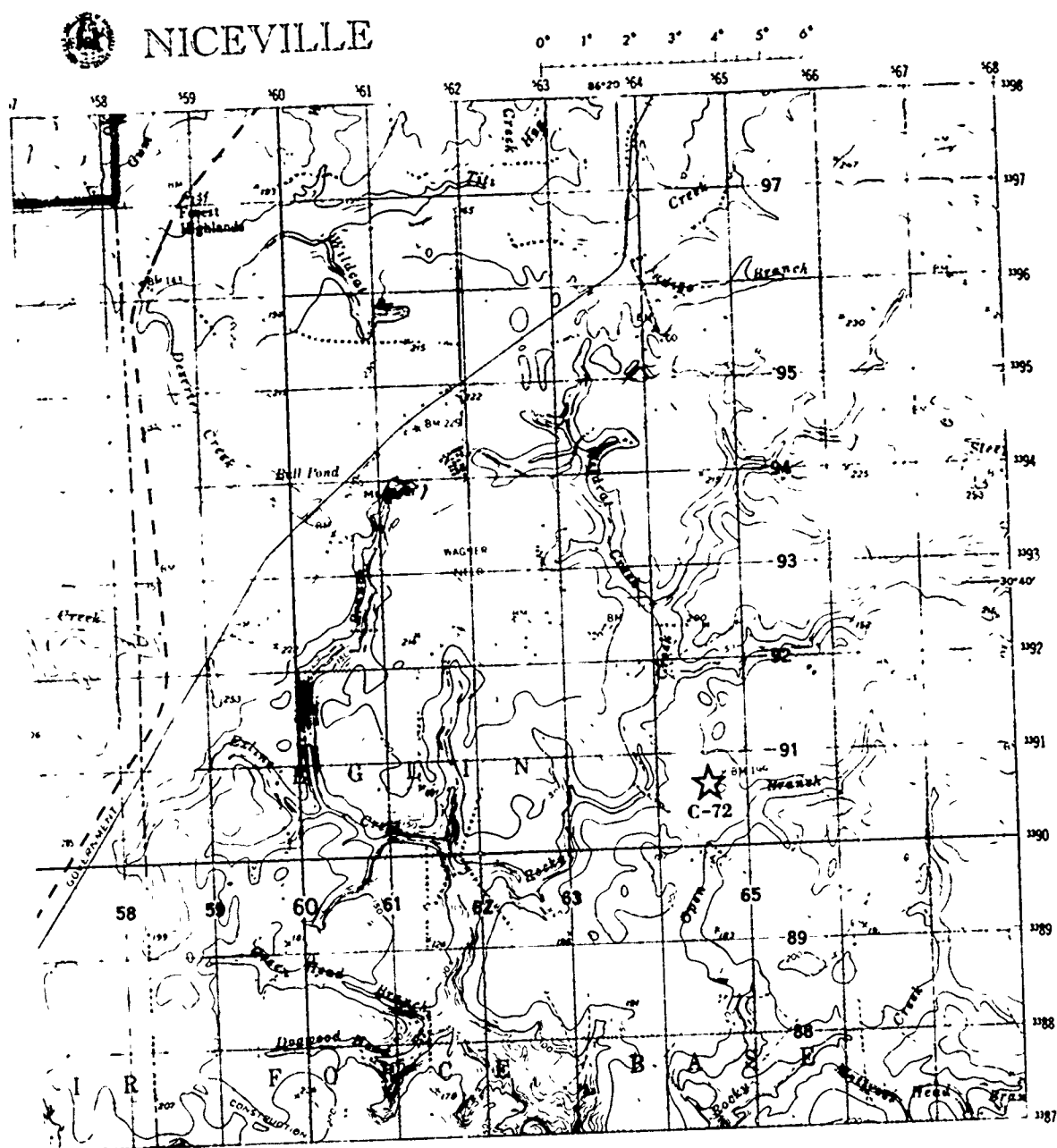


Figure 6. Map Showing Location of Test Area C-72

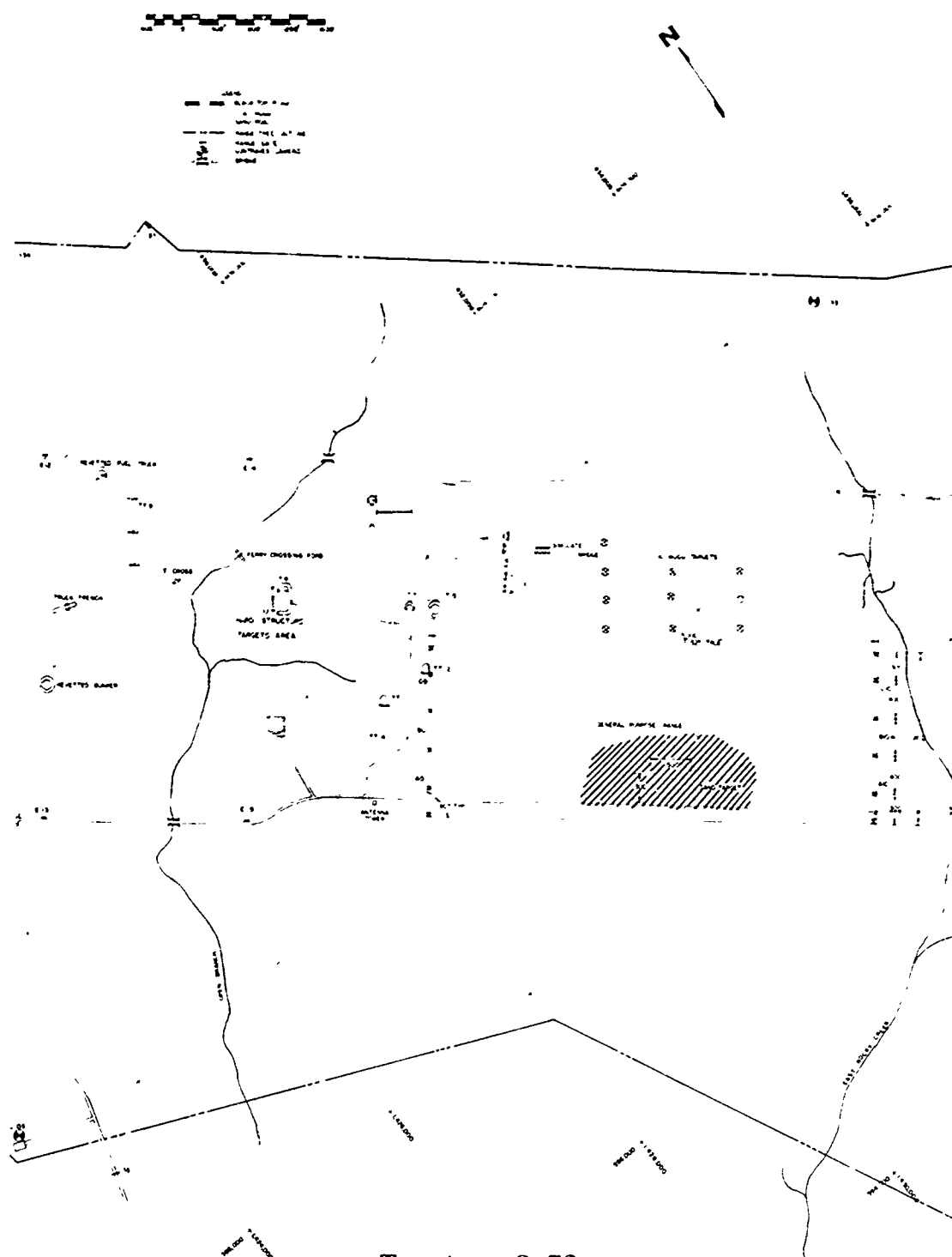


TABLE I. SOIL PROPERTIES OF SAND TEST SITE E8-01, TEST AREA C-72														
USDA ^a Percent by weight				USCS ^b Percent by weight				Grain	Size	Amount Retained on U. S. Sieve of Size				
Gravel	Sand	Silt	Clay	Type	Gravel	Fines	Type		4	10	30	50	100	200
-	94	4	2	S	-	7	SP-SM		-	-	2	42	44	5
Soil Constituents														
Depth of Sample, Inches				Clay			Non-Clay							
				Vermiculite	Kaolinite		Quartz	Plagioclase	Feldspar	Hematite				
0 - 3				Minor	Very Minor			Abundant	Minor			Very Minor		
				Grain Shape										
Sieve Size				Tabular	Irregular	Elongated		Shear-Graph Data ^c , ϕ_v						
				(Percent retained on sieve)										
50				1	98		1	22						
100				Trace	99		1							
a USDA - U. S. Department of Agriculture Textural System b USCS - Unified Soil Classification System c ϕ = angle of internal friction in degrees; subscript v denotes sheargraph measurement with vaned foot.														

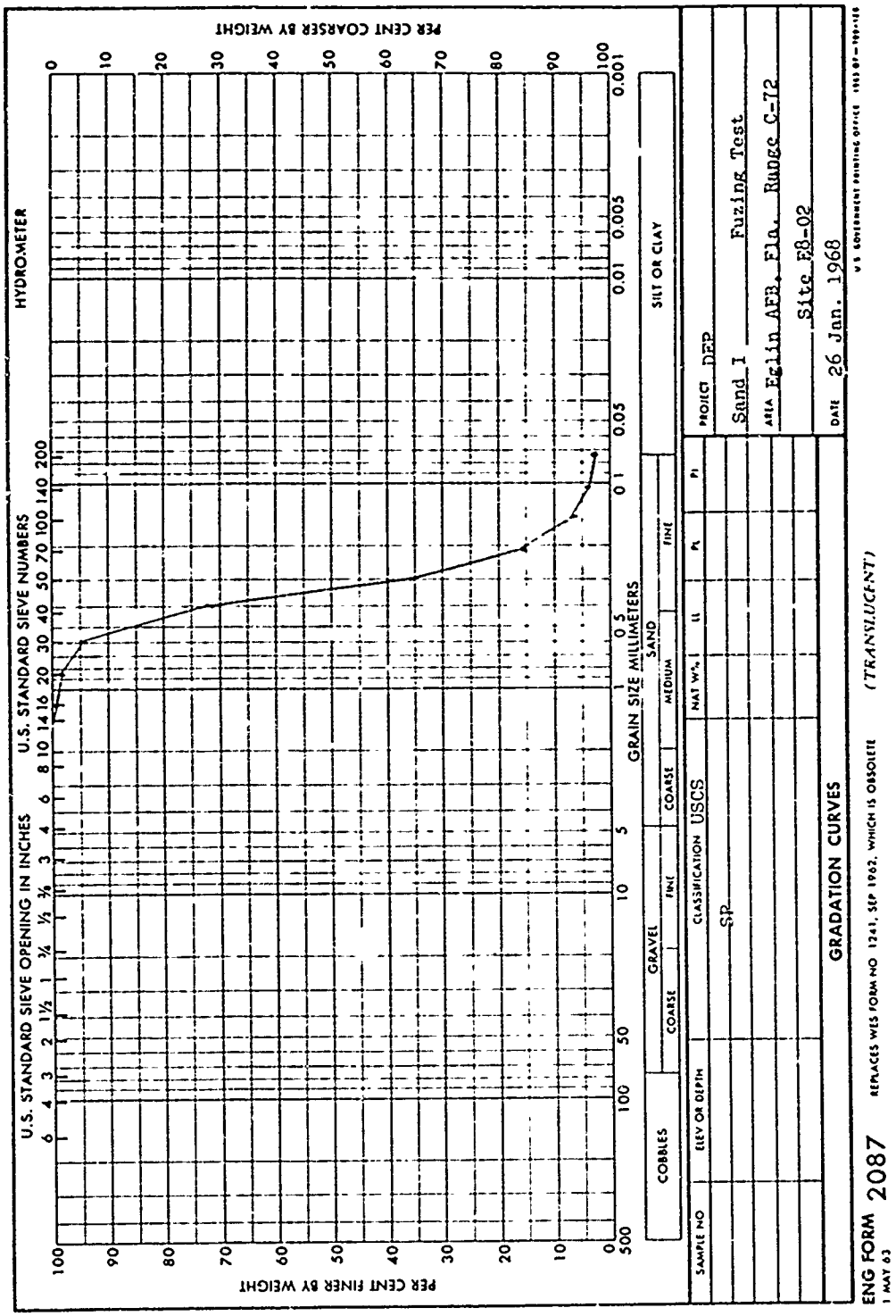


Figure 8. Analysis of Soil Samples from Fuzing Test at Test Area C-72

SECTION II

SOIL PREPARATION

Prior to testing, Sand I was described as loosely packed and having a low moisture content. Upon test implementation, Sand I characteristics data were modified to reflect a low moisture content and constant density. Penetrometer readings were taken as follows: surface, less than four; at a depth of 7.5 cm (3 inches), about 15; and at 30 cm (12 inches), not greater than 100 on the cone index gauge. To achieve these conditions, a soil stabilizer churned the sand to a depth of 30 cm. This process fluffed the soil for the penetrometer readings and aided in drying. Figures 9 and 10 show a field that has been prepared for testing.

Two observations were noted after the field had undergone preparation. The soil would crust rapidly to a depth in excess of one inch when high winds followed a rain. The top layers of soil would also crust when exposed to the sun for long periods of time. High penetrometer readings at surface reflect the degree of this crusting action. Figure 11 depicts crusting action as noted by the different shades of the soil. The top layer, which has dried and crusted, appears light in color, whereas the lower layers are quite moist and appear darker.

If a munition item landed in the tracks of the soil stabilizer, fuze function was not accepted as a valid data point.



Figure 9. Prepared Test Site C-72

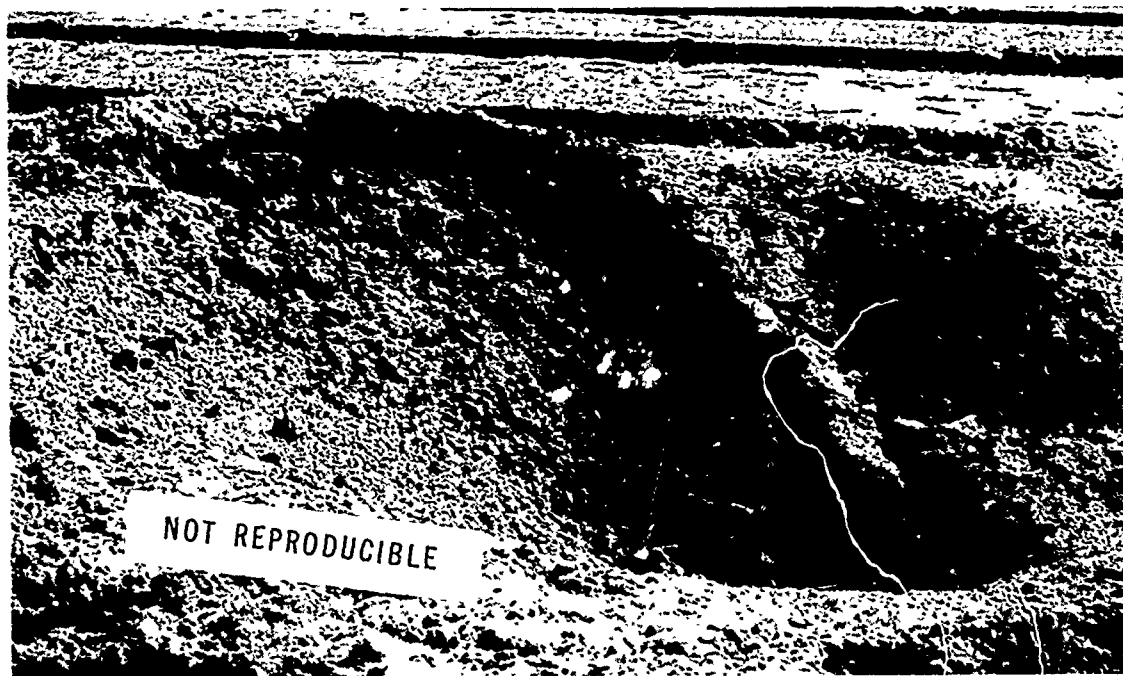


Figure 10. Crater at Test Site C-72



Figure 11. Procedure for Taking Soil Samples

SECTION III

EQUIPMENT AND METHOD

The cone penetrometer consists of a pressure ring; a gauge, which measured the cone index reading from zero to 100; two 50.5 cm metal rods that are notched at increments from 2.5 to 15 cm (1 to 6 inches), at 22.5 cm (9 inches), and at 30 cm (12 inches); and a cone, which has a 3.22 sq cm (0.5 square inch) surface. With the 3.22 sq cm cone, index readings may be read directly into pounds per square inch, on a one-to-one correlation.

As the penetrometer was pushed into the ground with constant pressure, cone index readings were recorded as shown in Figure 12. Care was taken to set the scale at zero before each probe. Penetrometer data may be found in the Appendix.

Adjacent to where the penetrometer readings were taken, a soil sample was then extracted by means of a volume cylinder to determine the moisture content and density. The soil sample came from the 5.0 to 10.0 cm depth band as shown in Figure 11. It was then put into a can, sealed, and later weighed. After drying for 24 hours under controlled conditions, its dry weight was recorded. Moisture content and wet and dry densities were then calculated and are presented in Table II.

Wet Density = 0.24 (Wet soil weight in grams)

Dry Density = 0.24 (Dry soil weight in grams)

Moisture Content = $\frac{\text{Water weight in grams}}{\text{Dry soil weight in grams}}$

Where 0.24 is a constant for the volume cylinder.



Figure 12. Procedure for Taking Penetrometer Readings

TABLE II. SAND MOISTURE-DENSITY DATA							
Test Area	Station No.	Date	Moisture Content %	Wet Density		Dry Density	
				g/cm ³	lb/ft ³	g/cm ³	lb/ft ³
B-76	7	1 May 68	7.7	1.5169	94.7	1.4112	88.1
	13		6.2	1.4961	93.4	1.4064	87.8
	28	6 May 68	4.6	1.3759	85.9	1.3199	82.4
	33		4.7	1.4128	88.2	1.3487	84.2
	41	7 May 68	3.7	1.3888	86.7	1.339	83.6
	49		5.0	1.4849	92.7	1.4128	88.2
	50		4.4	1.4416	90.0	1.3791	86.1
	59		4.4	1.3791	86.1	1.3183	82.3
	77	8 May 68	3.3	1.4480	90.4	1.4016	87.5
	80		3.7	1.3952	87.1	1.3439	83.9
	85		3.7	1.3103	81.8	1.2622	78.8
	88		1.4	1.4064	87.8	1.3519	84.4
	93	9 May 68	3.2	1.3808	86.2	1.3375	83.5
	120		3.8	1.4288	89.2	1.3759	85.9
	103		2.4	1.3359	83.4	1.2975	81.0
	99		2.9	1.4528	90.7	1.4032	87.6
	121	10 May 68	3.5	1.4705	91.8	1.4208	88.7
	132		3.3	1.4224	88.8	1.3775	86.0
	133	13 May 68	2.6	1.4817	92.5	1.4448	90.2
	139		2.0	1.4560	90.9	1.4288	89.2
	153		1.7	1.3695	85.5	1.3455	84.0
	239	27 June 68	5.2	1.2142	75.8	1.1549	72.1
	249		4.8	1.2798	79.9	1.2222	76.3
	236		4.2	1.2862	80.3	1.2234	77.0
	199		3.8	1.3247	82.7	1.2750	79.6
	253		4.2	1.3295	83.0	1.2766	79.7
B-76	257	29 June 68	3.3	1.4528	90.7	1.4080	87.9
	267		2.5	1.4208	88.7	1.3856	86.5
	272		1.9	1.4992	93.6	1.4705	91.8
	284	30 June 68	0.8	1.4400	89.9	1.4288	89.2
	283		3.3	1.4112	88.1	1.3663	85.3
	301		2.5	1.4640	91.4	1.4272	89.1
	308	5 July 68	3.6	1.4448	90.2	1.3936	87.0
	319		3.6	1.4993	93.6	1.4464	90.3

TABLE II. SAND MOISTURE-DENSITY DATA (Continued)							
Test Area	Station No.	Date	Moisture Content %	Wet Density		Dry Density	
				g/cm ³	lb/ft ³	g/cm ³	lb/ft ³
C-72	355	11 July 68	5.5	1.3119	81.9	1.2430	77.6
	366		5.4	1.3375	83.5	1.2686	79.2
	368		3.7	1.2750	79.6	1.1917	74.4
	363		5.6	1.3071	81.6	1.2414	77.5
	386	25 July 68	5.4	1.3215	82.5	1.2542	78.3
	411		5.0	1.3199	82.4	1.2574	78.5
	434	31 July 68	4.6	1.2622	78.8	1.2078	75.4
	441		4.3	1.2670	79.1	1.2142	75.8
	451		5.4	1.2606	78.7	1.1965	74.7
	459		4.9	1.2670	79.1	1.2078	75.4
	489	1 Aug 68	4.3	1.3039	81.4	1.2510	78.1
	474		4.3	1.3215	82.5	1.2670	79.1
	499		5.1	1.2766	79.7	1.2142	75.8
	528	5 Nov 68	4.3	1.3343	83.3	1.2782	79.8
	509		5.1	1.3439	83.9	1.2782	79.8
	554		4.8	1.3359	83.4	1.2750	79.6
	575		4.1	1.3199	82.4	1.2686	79.2
	581	14 Nov 68	5.6	1.4320	89.4	1.3567	84.7
	614	21 Nov 68	7.2	1.4400	89.9	1.3407	83.7
	603		7.3	1.3647	85.2	1.2718	79.4
	629		6.3	1.4032	87.6	1.3215	82.5
	634		6.7	1.4785	92.3	1.3856	86.5
	649		6.5	1.3503	84.3	1.2686	79.2
	664	26 Nov 68	8.0	1.4304	89.3	1.3247	82.7
	693		8.0	1.9077	119.1	1.4064	87.8
	684		8.5	1.5185	94.8	1.4000	87.4
	688		7.1	1.4849	92.7	1.3872	86.6
	678		7.2	1.5073	94.1	1.4064	87.8

TABLE II. SAND MOISTURE-DENSITY DATA (Continued)							
Test Area	Station No.	Date	Moisture Content %	Wet Density		Dry Density	
				g/cm ³	lb/ft ³	g/cm ³	lb/ft ³
B-76	700	25 Feb 69	8.8	1.4416	90.0	1.3247	82.7
	699		7.8	1.414	88.3	1.4192	88.6
	694		8.4	1.6018	100.0	1.3791	86.1
	701		8.5	1.4560	90.9	1.3423	83.8
	702		8.4	1.4016	87.5	1.2927	80.7
C-72	703	28 Feb 69	4.8	1.3151	82.1	1.2558	78.4
	707		3.8	1.3087	81.8	1.2606	78.7
	713	4 Mar 69	5.4	1.3968	87.2	1.3263	82.8
	715		4.6	1.3551	84.6	1.2943	80.8
	719	10 Mar 69	7.0	1.5169	94.7	1.4544	90.8
	723	14 Mar 69	8.2	1.5041	93.9	1.3904	86.8
	731		6.6	1.4785	92.3	1.3872	86.6
	735		7.4	1.4945	93.3	1.3904	86.8
	759		5.8	1.5105	94.3	1.4288	89.2
	739		5.8	1.4288	89.2	1.3503	84.3
	727		7.3	1.4897	93.0	1.3872	86.6
	775		5.6	1.4865	92.8	1.4048	87.7
	767		7.0	1.4961	93.4	1.3984	87.3
	779	25 Mar 69	7.9	1.4977	93.5	1.3888	86.7
	783		7.2	1.4672	91.6	1.3679	85.4
	789		6.2	1.6018	100.0	1.3727	85.7
	793		5.6	1.4416	90.0	1.3647	85.2
	797		7.1	1.5121	94.4	1.4128	88.2
		26 Mar 69	6.4	1.4336	89.5	1.3471	84.1
			9.3	1.4480	90.4	1.3247	82.7
	801	28 Mar 69	5.3	1.4272	89.1	1.3567	84.7

TABLE II. SAND MOISTURE-DENSITY DATA (Concluded)							
Test Area	Station No.	Date	Moisture Content %	Wet Density		Dry Density	
				g/cm ³	lb/ft ³	g/cm ³	lb/ft ³
C-72	805	2 Apr 69	4.9	1.3808	86.2	1.3151	82.1
	809	23 Apr 69	4.8	1.2959	80.9	1.2382	77.3
	821	25 Apr 69	5.1	1.3039	81.4	1.2398	77.4
	825		5.4	1.3663	85.3	1.2959	80.9
	829		4.8	1.4176	88.5	1.3519	84.4
	837		4.5	1.430	89.3	1.3679	85.4
	833		6.0	1.3055	81.5	1.2318	76.9
	813		4.4	1.3295	83.0	1.2718	79.4
	817		5.3	1.2446	77.7	1.1821	73.8
	853	29 Apr 69	4.1	1.3135	82.0	1.2927	80.7
	857		3.8	1.3263	82.8	1.2782	79.8
	849		3.7	1.3183	82.3	1.2702	79.3
	841		5.1	1.3471	84.1	1.2862	80.3
	845		5.3	1.3808	86.2	1.3119	81.9
	861	6 May 69	4.0	1.3167	82.2	1.2654	79.0
	865		3.5	1.3455	84.0	1.3007	81.2
	869		4.5	1.2622	78.8	1.2078	75.4
	873		4.3	1.3119	81.9	1.2574	78.5
	877	23 May 69	4.7	1.3647	85.2	1.3039	81.4

SECTION IV

ANALYSIS

1. MEASUREMENTS OF VARIABLES

An examination of the measurements of the variables indicates how homogenous the test media was prepared. Since the soil sample came from the 5.0 cm (2 inch) to 10.1 cm (4 inch) depth band, the penetrometer, P, reading at a depth of 7.5 cm (3 inches) was chosen to correspond with the dry density, D, and percentage moisture, M. Data obtained from station numbers 694, 699, 700, 701, and 702 were not included in the analysis as they represented static tests conducted where the soil was not tilled. A frequency plot of each variable by range is found on Figures 13, 14, and 15. Additional properties of the variables may be found in Table III.

The coefficient of variation describes the amount of variation of each variable and is defined:

$$C = \frac{s}{\bar{x}} \times 100$$

where C is the coefficient of variation
s is the standard deviation of the variable and
 \bar{x} is the mean deviation of the variable, expressed in percent.

C is relative to the magnitude of the mean.

The standard error is defined as follows:

$$\frac{s}{\bar{x}} = \frac{s}{n}$$

where: s is the standard deviation of the mean and
 \bar{x}
n is the number of samples.

The standard error from combining both ranges indicates a good estimate was obtained for the variable means. Plots of confidence levels on variable means, with the standard errors noted, are found on Figures 16, 17, and 18.

Table IV contains the average cone index values for all penetrometer readings taken on TA's B-76 and C-72, and the combined ranges. Figures 16, 17, and 18 show the confidence band width at any desired confidence levels from 50 to 99.9 percent.

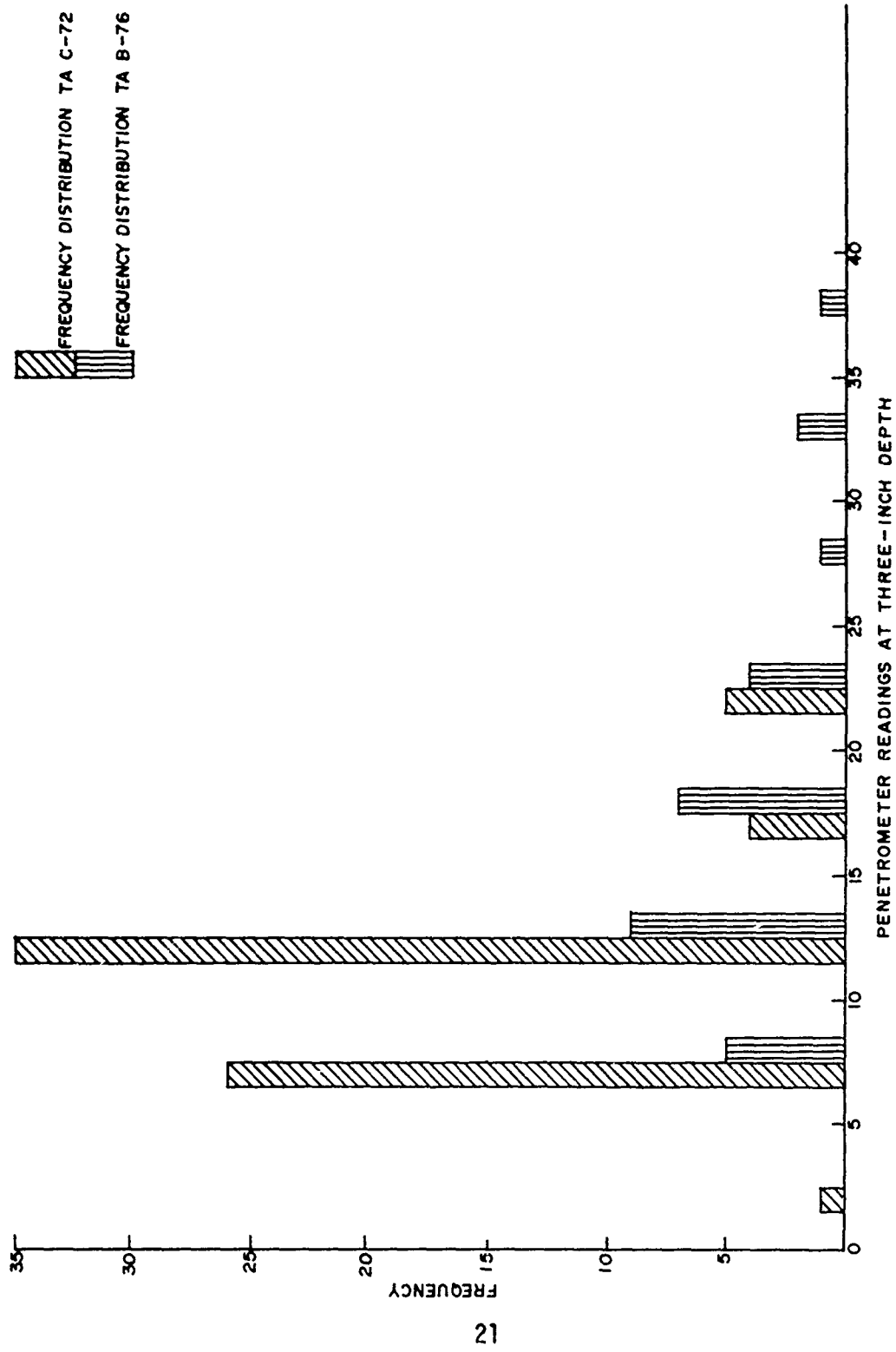




Figure 13. Penetrometer Readings at Three-Inch Depth, Frequency Distribution

 FREQUENCY DISTRIBUTION TA C-72
 FREQUENCY DISTRIBUTION TA B-76

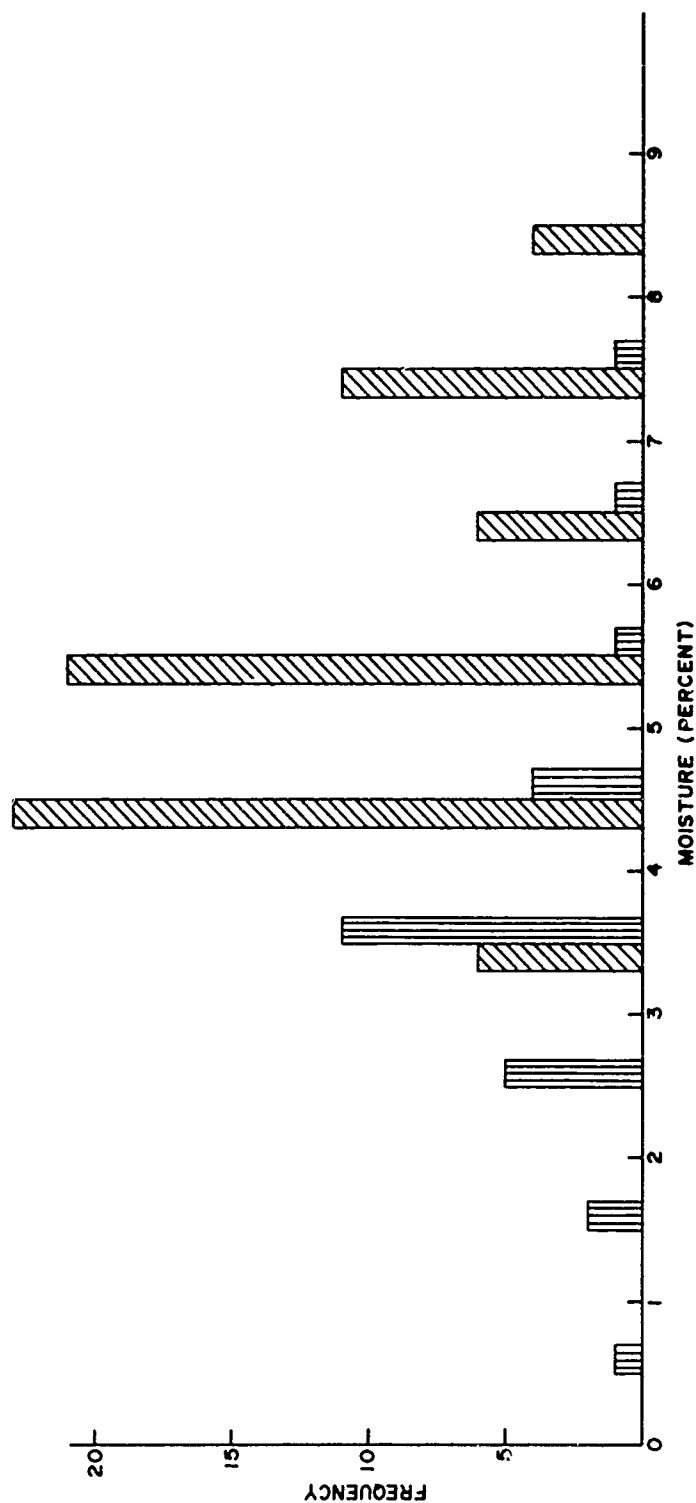


Figure 14. Percent Moisture, Frequency Distribution

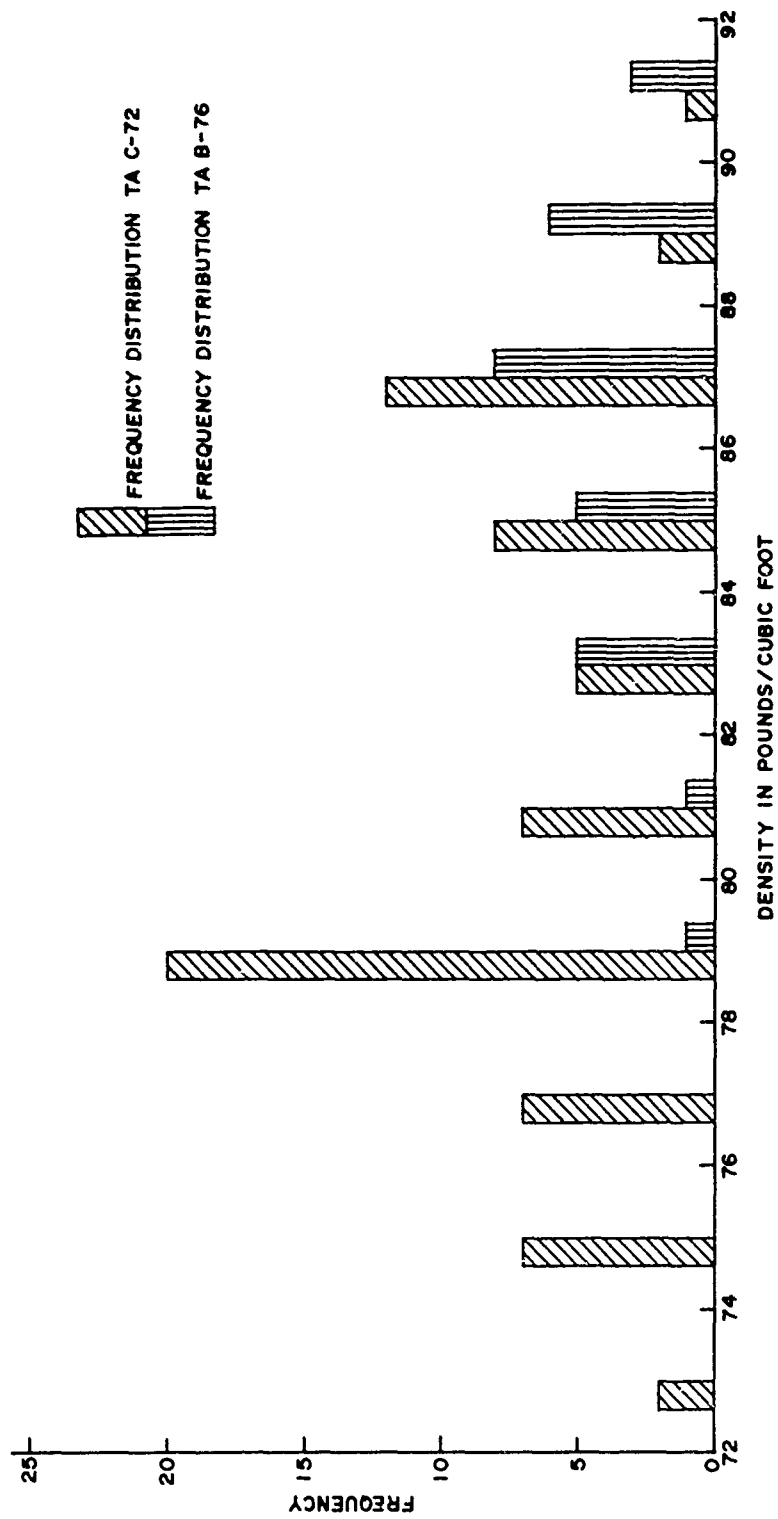


Figure 15. Density Reading, Frequency Distribution

TABLE III - MEASUREMENTS OF VARIABLES

Test Area	Variable	n	Mean \bar{x}	Standard Deviation s	Variance s^2	High Point	Low Point	Coefficient of Variation	Mean Standard Error $s_{\bar{x}}$
C-72	D	71	81.25	4.38	19.18	90.8	72.1	5.4 %	0.5198
	M	71	5.48	1.28	1.63	8.5	3.5	23.4 %	0.1519
	P	71	12.23	4.27	18.26	24.0	6.0	34.9 %	0.5068
B-76	D	29	86.22	3.04	9.22	91.8	82.3	3.5 %	0.5645
	M	29	3.44	1.41	2.00	7.7	0.8	41.0 %	0.2618
	P	29	17.83	8.12	65.86	38.0	6.0	45.5 %	1.5078
COMBINED	D	100	82.70	4.62	21.31	91.8	72.1	5.6 %	0.462
	M	100	4.89	1.61	2.58	8.5	0.8	32.9 %	0.161
	P	100	13.85	6.17	38.07	38.0	6.0	44.5 %	0.617

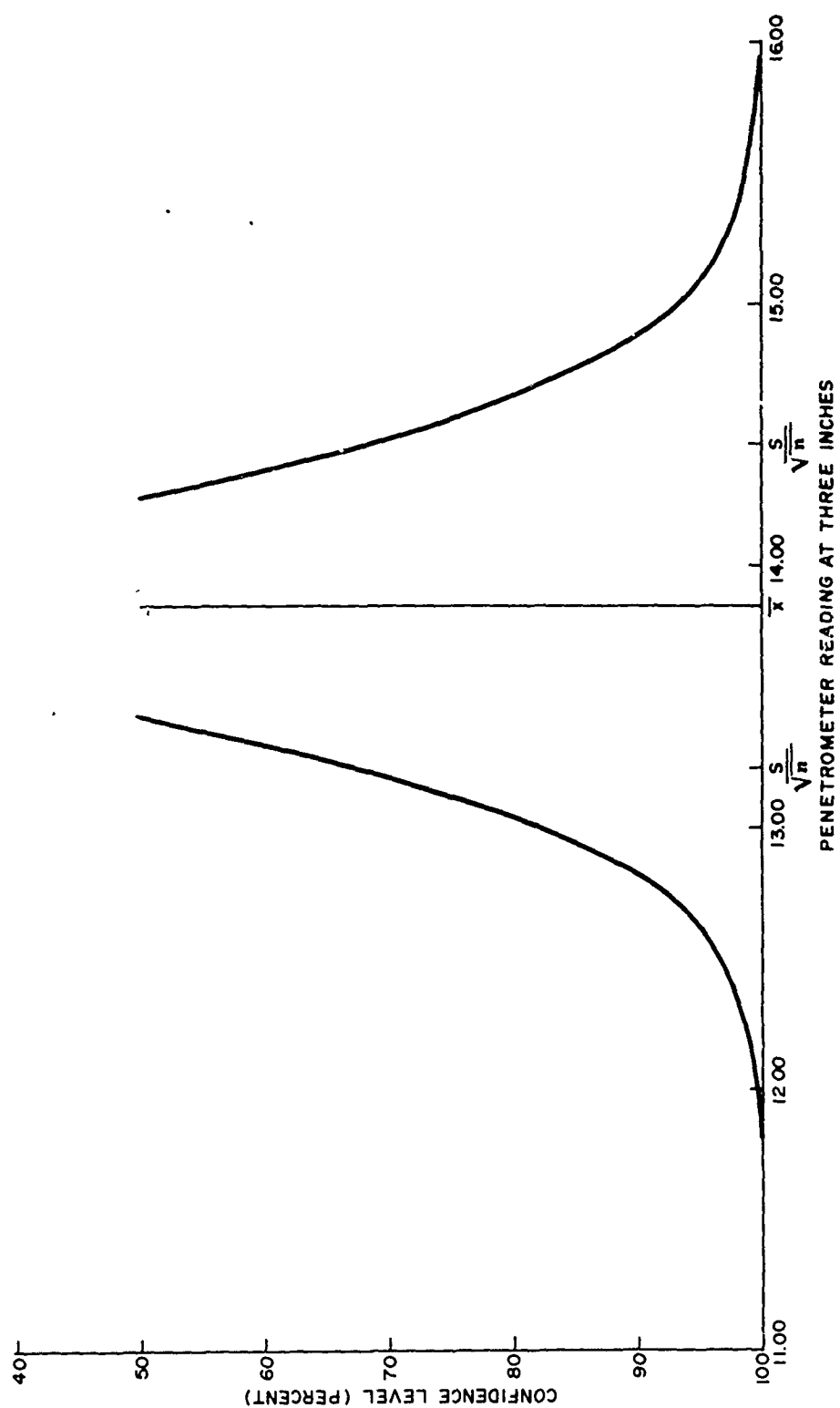


Figure 16. Confidence Level About Penetrometer Mean-Combined Ranges

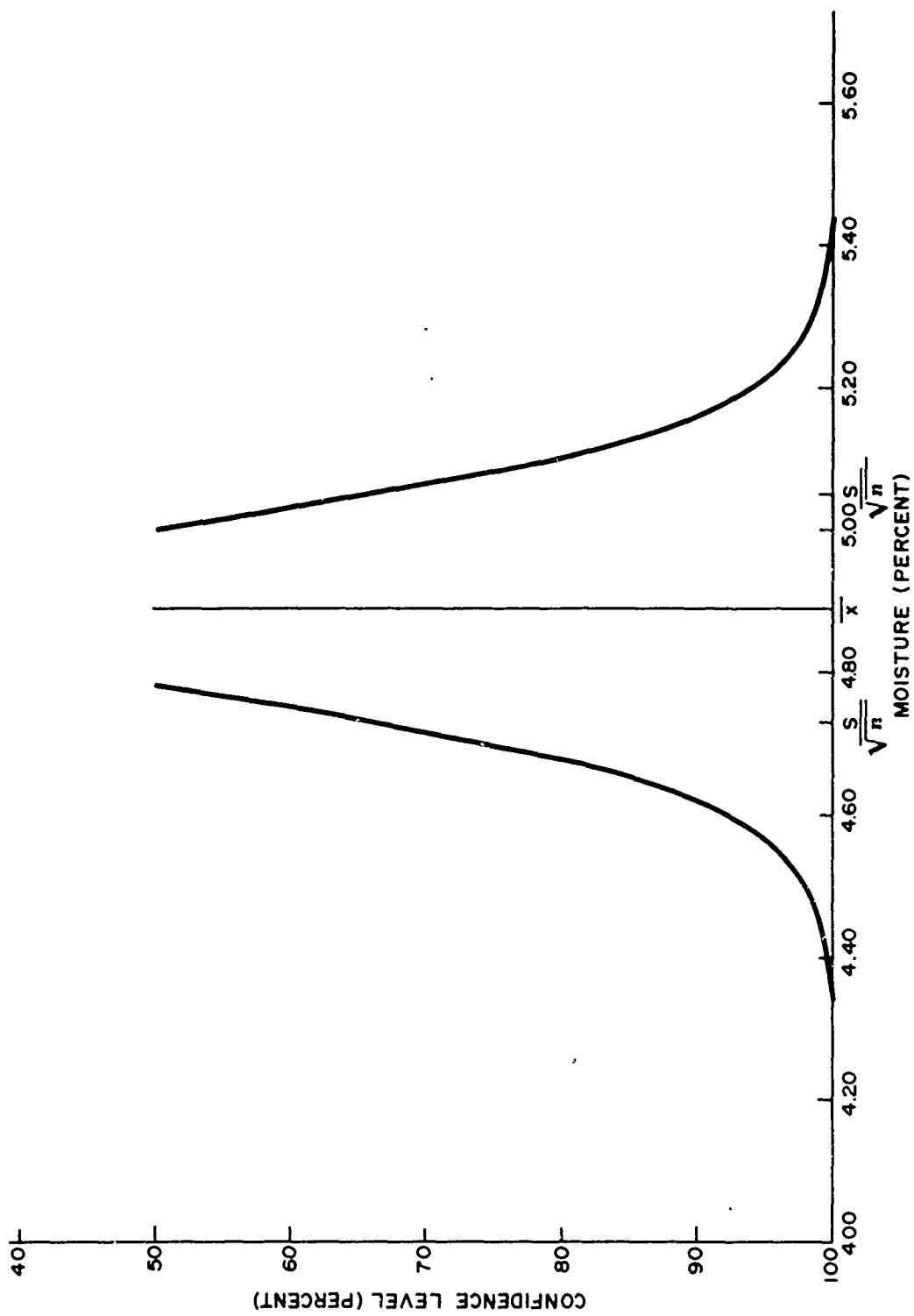


Figure 17. Confidence Level About Percent Moisture Mean-Combined Ranges

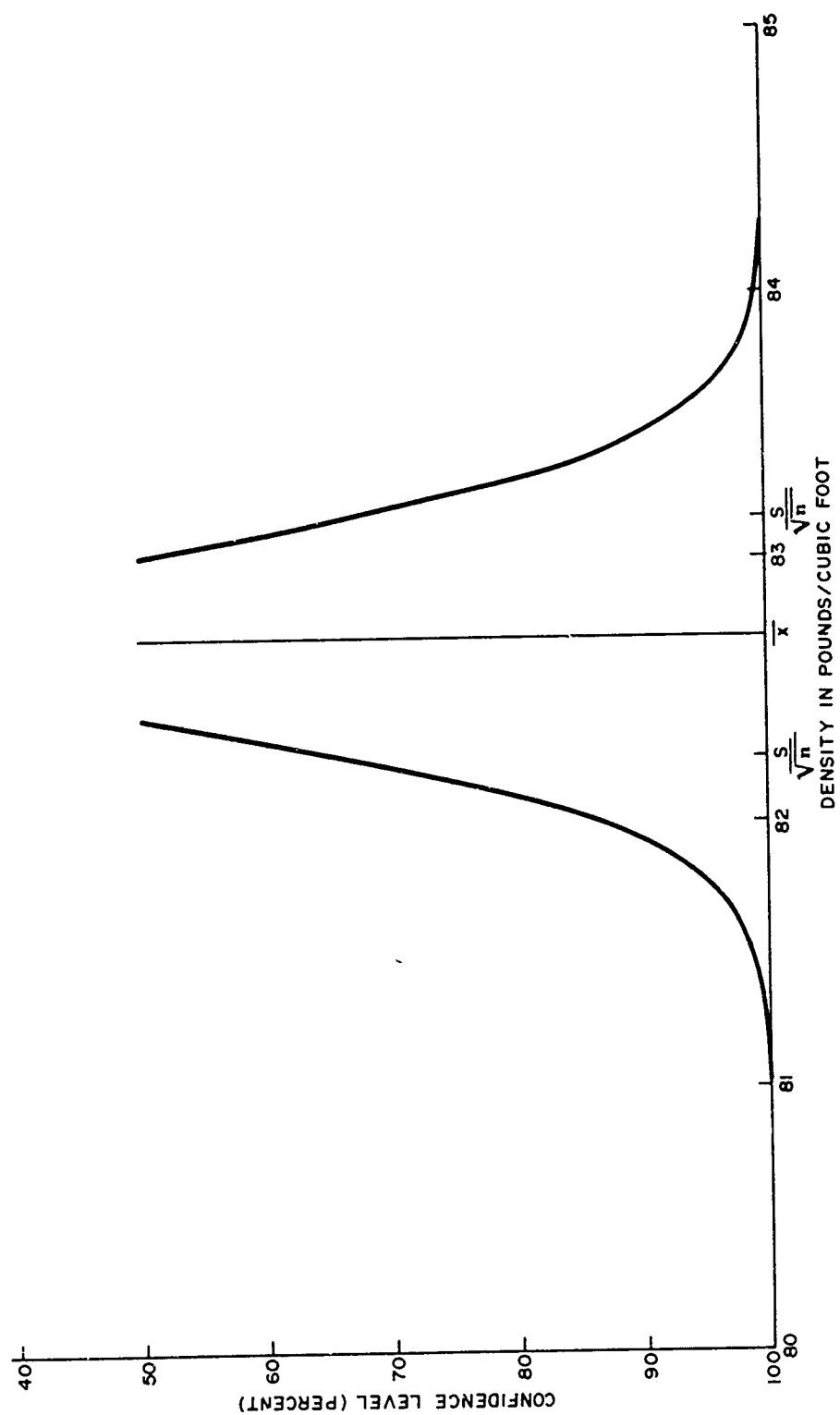


Figure 18. Confidence Level About Density Mean-Combined Ranges

TABLE IV - CONE INDEX READINGS

Test Area	Average Cone Index Readings at Depths in Centimeters									
	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0	
C-72	5	8	10	11	13	15	18	26	53	
B-76	8	8	12	16	19	22	26	46	84	
COMBINED	6	8	11	12	14	16	19	31	60	

2. RELATIONSHIP OF VARIABLES

A plot of the raw data, using paired variables, failed to show much of a relation (Figures 19, 20, and 21). Calculation of their correlation coefficient, r , is another method of measuring the relationship of the paired variables:

$$r = \frac{\sum (x_i - \bar{x}) (y_i - \bar{y})}{\sqrt{[\sum (x_i - \bar{x})^2] [\sum (y_i - \bar{y})^2]}}$$

The correlation coefficient measures the degree of closeness of the linear relationship between paired variables. The correlation coefficient is dimensionless and lies between $+1$. When the variables tend to increase together, r will be positive; when one tends to increase and the other decrease, r will be negative. Values of ± 1 denote perfect correlation between the paired variables, while $r = 0$ denotes no correlation. See Table V.

An analysis of variance table was calculated to see if a statistical relation existed. It was found that the sum of squares due to fitting the slope was so small that it had no effect upon predicting a dependent variable. The residual mean squares are given in Table V. The same residual mean square value was obtained for the dependent variable regardless of the independent variable.

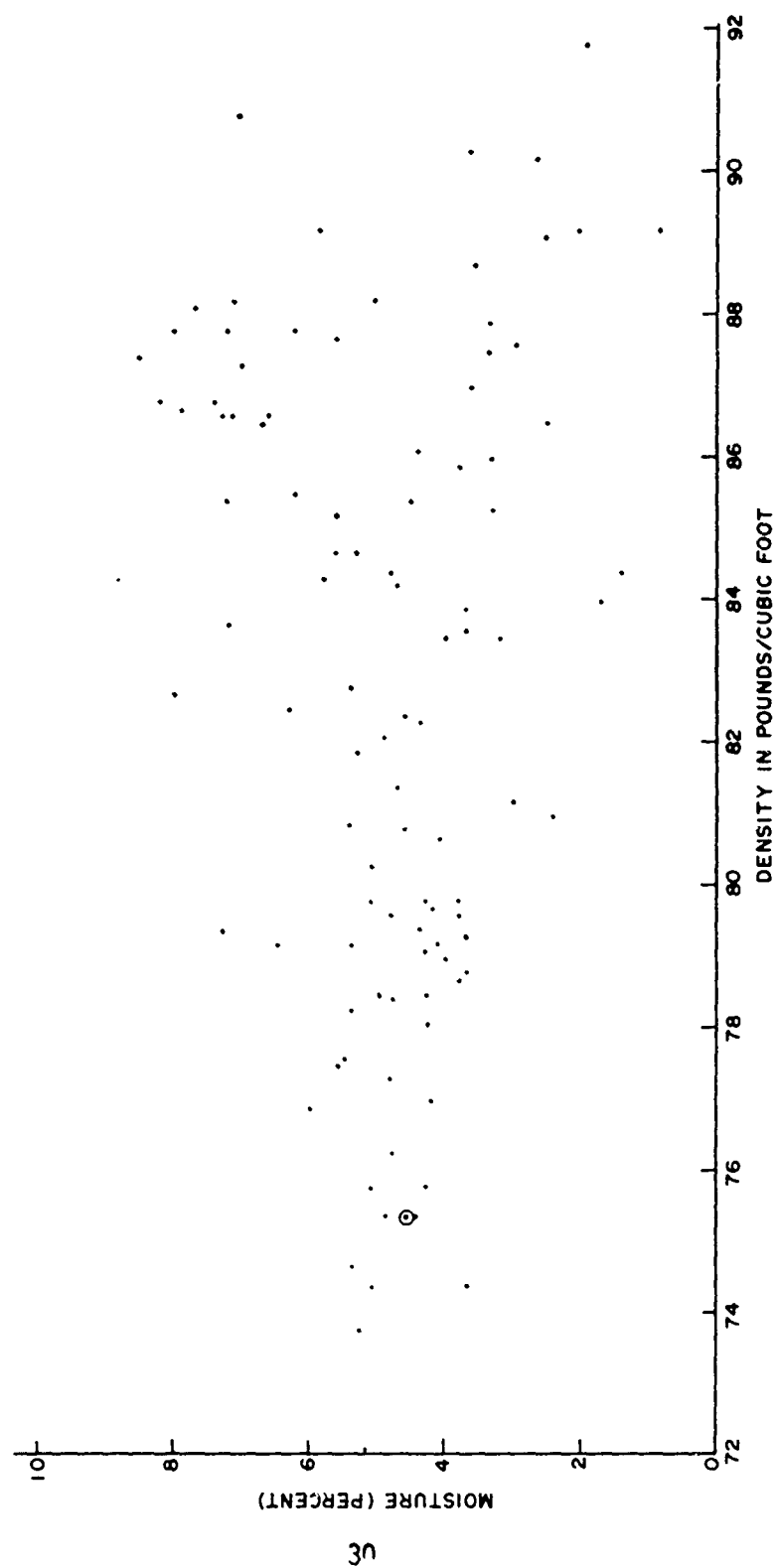


Figure 19. Moisture vs Density (Raw Data)-Combined Ranges

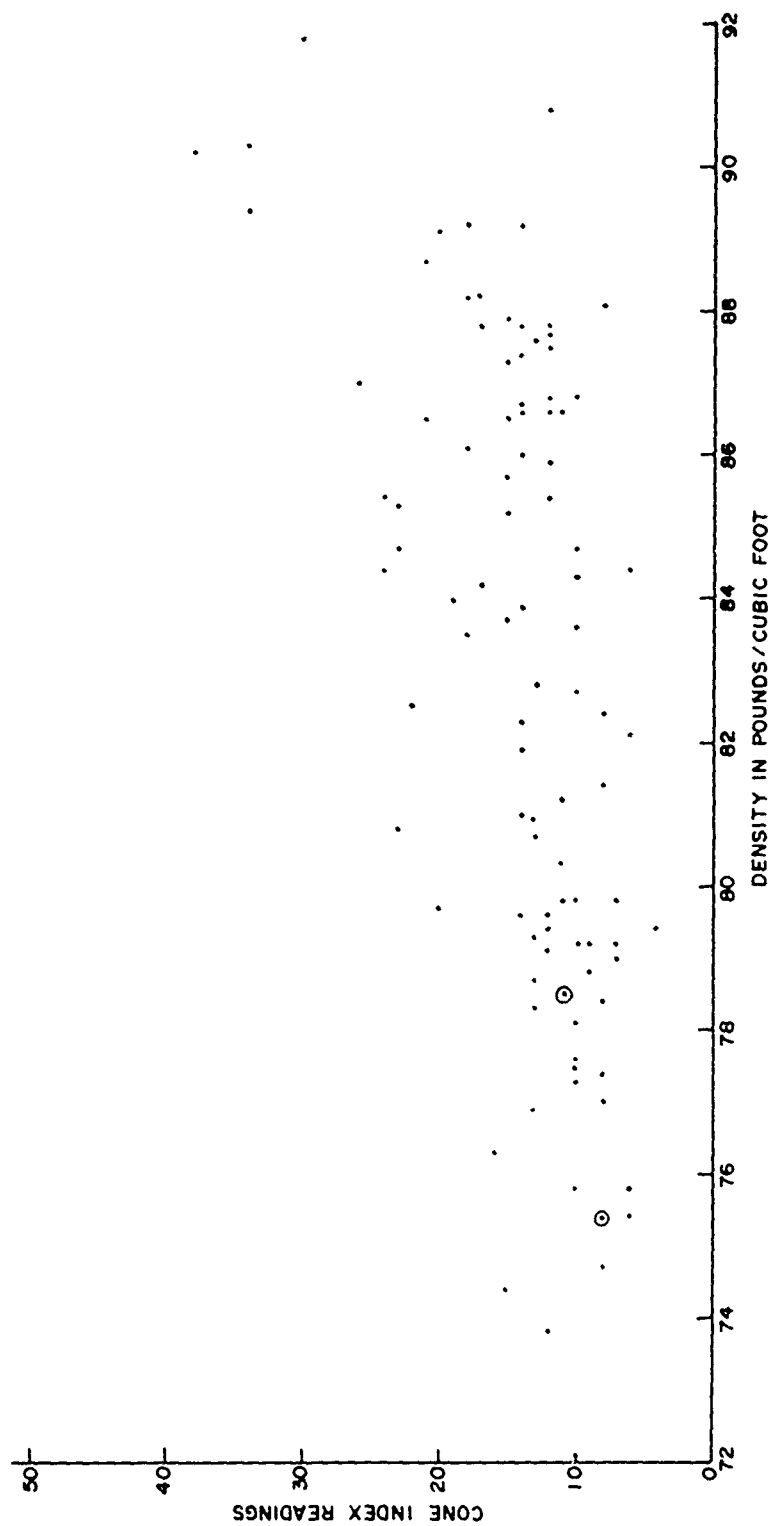


Figure 20. Penetrometer Readings vs Density (Raw Data)-Combined Ranges

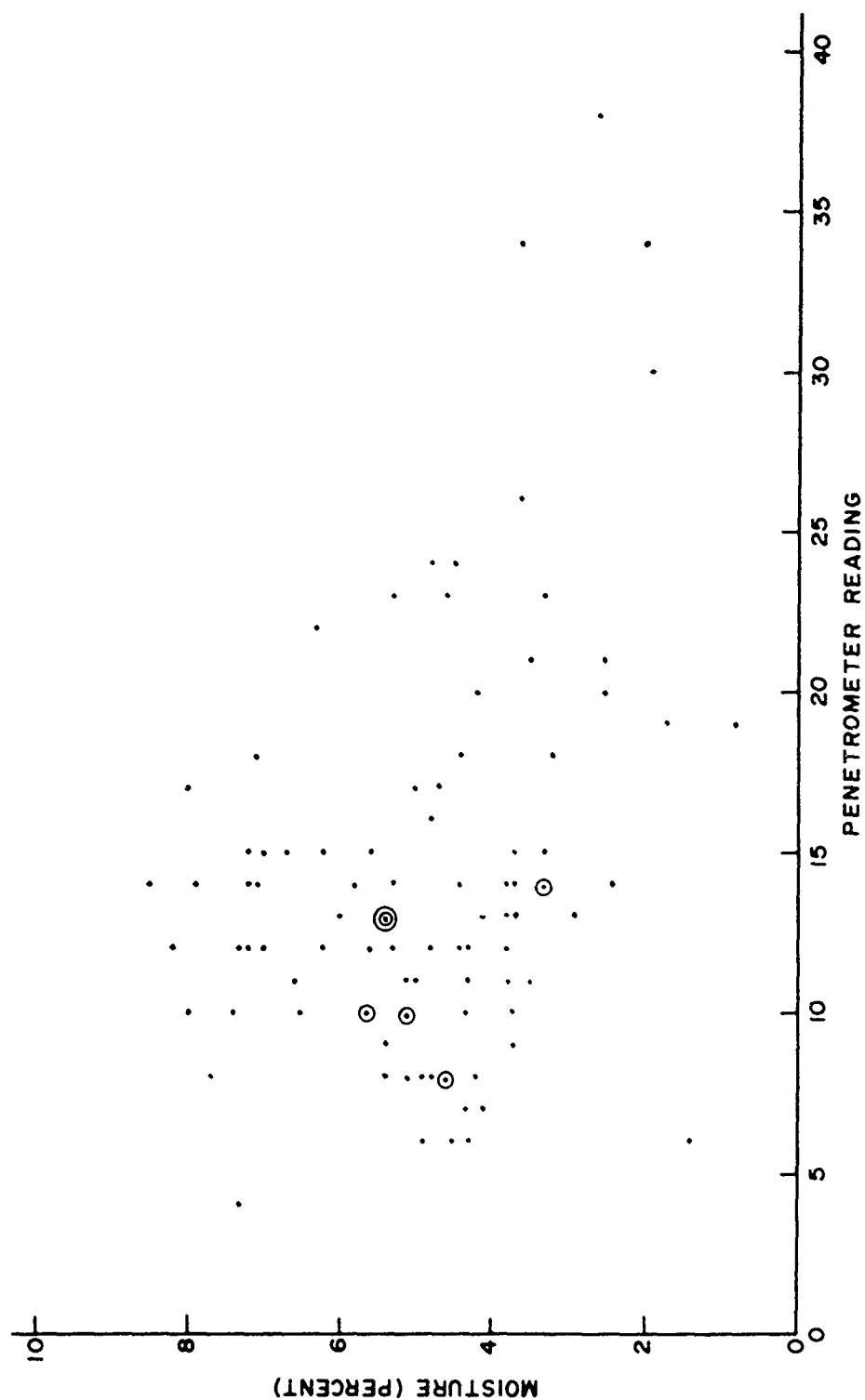


Figure 21. Moisture vs Penetrometer Readings (Raw Data)-Combined Ranges

TABLE V - CORRELATION COEFFICIENTS AND RESIDUAL MEAN SQUARES

TEST AREA	CORRELATION COEFFICIENT		RESIDUAL MEAN SQUARE (WHEN THE VARIABLE WAS A DEPENDENT VARIABLE)			
	P, M	P, D	D, M	P	D	M
B-76	-0.3537	0.6148	-0.1016	68.30	9.57	2.07
C-72	-0.1780	0.4124	0.6476	18.53	19.46	1.65
COMBINED	-0.3093	0.5454	0.0433	38.46	21.53	2.57

SECTION V

CONCLUSION

It should be emphasized that the data are based on a unique environment and the results should not be applied to other environments. Variation in the individual variables from range-to-range can be seen in the frequency plots (Figures 13 through 15) and in the means (Table II). The coefficient of variation indicated a large spread of each variable except density, but the standard error indicates that a good estimate of the means was obtained.

Only density had a small variation. Moisture may have been affected by range location or weather conditions while human error or ability to till properly may have affected the penetrometer readings.

When the data from both ranges are combined, the resultant outcomes are biased toward TA C-72 because of the number of data points. The variations between ranges indicate the difficulty in attempting to predict outcomes in other locations, assuming similar conditions.

The analysis of variance table showed that the variables are independent of each other. Predicting a variable by guessing its mean is as accurate as calculating it from a regression equation.

APPENDIX
PENETROMETER READINGS
AT
TEST AREAS B-76 AND C-72

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PENETROMETER DATA

1 MAY 64 RANGE 76 LINE NO. 110
 DATA COLLECTED FROM 0901 TO 0924 HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS				
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
2900	2070	1	003	008	011	014	016	018	021	028	072
2992	2070	2	003	008	010	012	014	017	019	030	084
3084	2070	3	004	008	010	012	014	017	019	026	072
3176	2070	4	004	008	010	011	014	016	019	025	066
3268	2070	5	004	008	011	012	014	017	019	030	070
3360	2070	6	004	008	010	013	014	016	018	024	066
3360	2170	7	002	005	006	008	010	013	014	024	060
3268	2170	8	004	008	010	012	014	015	018	030	076
3176	2170	9	004	008	010	011	013	015	018	028	066
3084	2170	10	004	007	010	011	013	014	018	028	068
2992	2170	11	004	009	011	012	014	014	018	030	090
2900	2170	12	004	008	011	013	014	017	020	030	100
2900	2270	13	004	008	011	012	013	014	019	020	022
2992	2270	14	004	010	011	013	014	016	020	026	074
3084	2270	15	004	008	011	012	014	016	019	024	074
3176	2270	16	004	009	011	014	016	018	020	026	080
3228	2270	17	004	008	010	012	013	014	018	028	074
3360	2270	18	003	008	010	012	013	016	019	026	060
3360	2370	19	003	009	010	012	016	022	024	032	070
3228	2370	20	005	010	012	013	014	018	022	032	062
3176	2370	21	005	009	011	013	014	017	020	028	070
3084	2370	22	004	009	012	013	018	018	021	030	068
2992	2370	23	004	009	012	014	017	022	024	036	070
2900	2370	24	004	009	010	012	014	018	020	034	066
AVERAGE CI AT EACH DEPTH			004	008	010	012	014	017	019	028	070

PENETROMETER DATA

6 MAY 64 RANGE 76 LINE NO. 153
 DATA COLLECTED FROM 0850 TO 0905 HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS				
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
2070	2900	25	005	010	012	014	018	021	028	052	096
2170	2900	26	005	009	010	013	015	022	026	058	100
2270	2900	27	004	006	007	008	010	012	014	056	100
2370	2900	28	004	006	007	008	009	010	014	052	094
2370	3050	29	002	003	004	005	007	008	012	054	096
2270	3050	30	002	003	004	005	008	008	010	052	096
2170	3150	31	002	005	006	007	008	010	016	072	100
2070	3050	32	003	005	009	010	012	014	018	058	100
2070	3200	33	005	014	015	017	020	024	030	054	100
2170	3200	34	004	013	016	019	021	024	028	060	100
2270	3200	35	004	010	012	015	020	022	030	072	094
2370	3200	36	004	010	012	015	016	021	028	054	100
2370	3350	37	004	010	013	014	017	022	028	074	100
2270	3350	38	005	010	014	015	019	024	032	086	100
2170	3350	39	005	012	014	015	018	022	030	076	100
2070	3350	40	004	010	012	015	018	024	028	092	100
AVERAGE CI AT EACH DEPTH			004	009	010	012	015	018	023	064	099

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PENETROMETER DATA

7 MAY 63 RANGE 76 LINE NO. 181/182
 DATA COLLECTED FROM TO HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE
 POSITION IN CENTIMETERS STATION CONE INDEX READINGS AT DEPTHS IN CENTIMETERS

X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
1900	3000	41	004	008	009	010	012	014	018	032	100
2200	3000	42	002	005	006	008	009	012	014	022	100
2500	3000	43	002	004	006	007	008	009	010	014	100
2900	3000	44	004	009	010	012	013	014	016	024	050
3100	3000	45	005	010	014	015	016	019	022	036	090
3400	3000	46	004	009	010	011	013	015	018	026	072
3700	3000	47	004	006	008	009	010	010	012	018	066
4000	3000	48	003	008	009	010	011	012	014	022	040
4300	3000	49	006	012	015	017	020	022	016	040	100
4300	3200	50	005	010	016	018	022	023	024	036	082
4000	3200	51	006	012	015	018	020	022	023	032	060
3700	3200	52	003	006	008	010	010	012	013	020	040
3400	3200	53	003	006	008	009	010	012	014	019	076
3100	3200	54	005	012	014	015	017	020	022	032	048
2800	3200	55	006	009	011	012	013	014	015	025	048
2500	3200	56	002	005	008	009	010	012	014	020	052
2200	3200	57	003	005	007	008	010	010	012	018	100
1900	3200	58	006	011	014	014	018	022	028	042	100
1900	3400	59	004	012	014	014	016	019	022	037	057
2200	3400	60	003	006	008	010	010	012	015	018	072
2500	3400	61	002	005	006	009	010	011	012	018	048
2800	3400	62	004	009	010	011	012	015	020	026	042
3100	3400	63	006	010	014	015	015	017	022	030	080
3400	3400	64	005	008	010	012	014	016	017	020	058
3700	3400	65	004	008	008	010	011	013	015	020	090
4000	3400	66	004	007	010	011	012	014	016	026	100
4300	3400	67	005	010	012	012	013	014	019	026	072
4300	3600	68	004	006	007	008	010	010	012	022	100
4000	3500	69	004	006	008	009	010	012	014	026	084
3700	3600	70	003	005	008	009	009	011	013	026	092
3400	3600	71	004	010	014	014	015	018	022	040	100
3100	3600	72	005	010	012	014	014	015	018	028	064
2800	3600	73	004	010	010	012	014	018	021	038	076
2500	3600	74	005	008	010	011	012	013	015	026	054
2200	3600	75	004	008	010	012	012	014	015	022	060
1900	3600	76	004	010	010	012	014	014	018	032	080
AVERAGE CI AT EACH DEPTH			004	008	010	011	013	015	017	027	074

PENETROMETER DATA

8 MAY 68 RANGE 76 LINE NO. 181/182
 DATA COLLECTED FROM TO HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE
 POSITION IN CENTIMETERS STATION CONE INDEX READINGS AT DEPTHS IN CENTIMETERS

X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
2650	3000	77	009	011	013	014	016	020	028	062	100
2950	3000	78	008	011	011	012	013	016	023	062	100
3250	3000	79	015	020	021	026	030	036	046	084	100
3550	3000	80	011	013	014	014	016	022	026	066	100
3550	3200	81	012	013	014	015	016	019	023	052	100
3250	3200	82	002	003	004	004	005	007	011	042	070
2950	3200	83	006	010	011	013	014	018	034	062	100
2650	3200	84	006	008	009	010	010	014	022	050	100
2650	3400	85	005	007	009	009	010	012	016	060	100
2950	3400	86	010	015	015	019	022	028	036	080	100
3250	3400	87	008	011	014	016	020	028	040	100	100
3550	3400	88	002	004	006	006	007	009	012	036	100
3550	3600	89	005	008	009	010	011	011	014	024	086
3250	3600	90	004	006	006	007	008	009	010	028	090
2950	3600	91	002	003	004	004	005	005	006	032	100
2650	3600	92	002	004	004	006	006	007	008	046	100
AVERAGE CI AT EACH DEPTH			007	009	010	012	013	016	022	055	097

PENETROMETER DATA

9 MAY 68 RANGE 76 LINE NO. 194
 DATA COLLECTED FROM TO HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE
 POSITION IN CENTIMETERS STATION CONE INDEX READINGS AT DEPTHS IN CENTIMETERS

X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
2200	3000	93	007	012	015	018	022	025	031	057	100
2500	3000	94	007	013	016	017	021	026	032	052	100
2800	3000	95	007	012	015	019	025	030	037	054	100
3180	3000	96	007	015	015	019	024	028	036	056	100
3400	3000	97	004	012	015	017	020	025	031	052	100
3700	3000	98	007	011	015	018	022	026	034	058	100
4000	3000	99	006	009	010	013	015	020	024	044	100
4000	3200	100	003	006	008	009	012	014	015	040	100
3700	3200	101	003	007	010	013	014	016	018	040	100
3400	3200	102	002	005	007	009	011	012	013	030	100
3100	3200	103	003	006	010	014	014	014	013	034	100
2800	3200	104	002	005	008	011	011	012	012	036	100
2500	3200	105	003	006	009	012	014	014	016	022	100
2200	3200	106	004	010	011	012	014	017	019	027	100
2200	3400	107	002	004	007	010	010	010	012	032	100
2500	3400	108	002	005	006	008	009	011	011	034	100
2800	3400	109	003	006	007	007	011	011	014	038	100
3100	3400	110	003	005	007	008	010	012	014	034	100
3400	3400	111	002	004	006	008	010	011	014	048	100
3700	3400	112	002	005	005	007	009	012	013	038	100
4000	3400	113	002	004	007	008	010	011	012	040	100
4000	3600	114	002	004	005	008	011	011	016	024	100
3700	3600	115	004	009	009	012	012	016	018	054	100
3400	3600	116	004	008	010	012	016	020	024	054	100
3100	3600	117	005	010	013	014	016	021	027	046	100
2800	3600	118	007	013	017	022	028	034	044	070	100
2500	3600	119	005	011	012	014	015	019	024	048	100
2200	3600	120	004	008	012	012	014	016	022	040	100
AVERAGE CI AT EACH DEPTH			004	008	010	013	015	018	021	043	100

PENETROMETER DATA

10 MAY 63 RANGE 76 LINE NO. 128

DATA COLLECTED FROM TO HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS				
X	Y		0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
2850	2050	121	063	012	019	021	028	036	042	070	100
2950	2050	122	002	005	014	019	024	028	036	054	100
3050	2050	123	002	010	026	042	048	054	062	084	100
3150	2050	124	004	014	032	042	046	054	062	084	100
3250	2050	125	002	008	014	023	028	034	042	050	100
3350	2050	126	002	008	020	022	036	049	050	060	100
3350	2350	127	002	008	010	014	018	022	024	046	100
3250	2350	128	002	008	014	013	022	026	030	034	080
3150	2350	129	002	006	012	014	014	018	018	046	100
3050	2350	130	002	006	012	014	018	014	014	020	100
2950	2350	131	002	012	020	022	024	026	026	026	065
2850	2350	132	002	008	012	014	016	020	022	022	084
AVERAGE CI AT EACH DEPTH			002	009	017	022	027	032	036	050	094

PENETROMETER DATA

13 MAY 63 RANGE 76 LINE NO. 128

DATA COLLECTED FROM TO HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS				
X	Y		0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
2200	3000	133	004	010	023	038	048	050	058	090	100
2500	3000	134	004	010	030	040	048	050	052	078	100
2800	3000	135	006	014	032	046	052	054	058	100	100
3100	3000	136	003	009	018	030	040	050	056	092	100
3400	3000	137	004	012	026	032	044	050	054	062	100
3700	3000	138	002	008	020	030	042	050	054	078	100
4000	3000	139	002	006	016	034	044	052	054	096	100
4000	3200	140	001	004	010	018	026	034	054	100	100
3700	3200	141	002	008	016	024	030	032	038	060	100
3400	3200	142	004	012	014	018	022	024	028	050	100
3100	3200	143	006	018	020	020	028	028	030	050	100
2800	3200	144	003	010	018	022	026	028	032	072	100
2500	3200	145	002	010	013	015	016	018	018	062	100
2200	3200	146	002	004	011	014	016	016	017	040	100
2200	3400	147	004	014	020	024	024	028	030	044	100
2500	3400	148	004	012	020	024	026	030	036	070	100
2800	3400	149	004	012	020	024	026	037	050	100	100
3100	3400	150	003	009	014	018	020	021	024	031	100
3400	3400	151	002	006	014	024	029	030	031	100	100
3700	3400	152	006	016	021	021	022	025	026	052	100
4000	3400	153	006	016	018	019	020	020	021	029	100
4000	3600	154	003	007	012	015	016	016	016	100	100
3700	3600	155	002	014	021	023	026	034	037	058	100
3400	3600	156	002	010	022	026	027	030	036	066	100
3100	3600	157	008	028	028	030	031	038	042	050	100
2800	3600	158	002	009	024	032	036	040	044	064	100
2500	3600	159	002	012	020	024	026	031	036	076	100
2200	3600	160	002	008	016	022	024	026	030	052	100
AVERAGE CI AT EACH DEPTH			003	011	019	025	030	034	038	069	100

PENETROMETER DATA

27 JUNE 68 RANGE 72 LINE NO. 161/162-223

DATA COLLECTED FROM STATION NO. 161-248, 0928 TO 1055 HRS

STATION NO. 249-252, 1513 TO 1516 HRS

STATION NO. 253-255, 1518 TO 1520 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SO CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS			AT DEPTHS IN CENTIMETERS					
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0
0000	4600	161	001	004	005	006	006	007	008	014	024
2000	4600	162	002	005	007	003	008	009	011	016	026
4000	4600	163	002	006	007	007	008	009	010	015	027
8000	4600	164	002	007	009	011	011	011	013	018	034
10000	4600	165	001	003	006	009	011	012	013	017	026
12000	4600	166	002	007	008	009	009	010	012	017	030
14000	4600	167	004	008	010	012	012	013	015	021	042
16000	4600	168	002	006	008	010	013	015	016	018	024
16000	4900	169	002	006	008	009	009	009	013	018	026
14000	4900	170	004	009	011	012	012	013	015	024	035
12000	4900	171	003	005	008	010	011	012	015	019	032
10000	4900	172	002	005	007	007	008	011	013	020	032
8000	4900	173	002	006	009	009	010	011	014	018	052
4000	4900	174	002	007	009	010	011	014	014	020	042
2000	4900	175	005	010	012	012	013	013	015	023	038
0000	4900	176	005	010	010	011	011	013	016	026	044
0000	5200	177	002	007	008	009	009	011	014	019	026
2000	5200	178	002	006	009	010	011	012	014	024	042
4000	5200	179	002	007	008	010	011	012	013	018	040
8000	5200	180	002	007	009	011	012	013	016	030	048
10000	5200	181	002	007	008	009	010	012	014	020	034
12000	5200	182	002	009	009	010	012	013	015	023	040
14000	5200	183	005	012	014	014	015	016	016	027	050
22000	5200	184	004	010	014	016	019	020	024	040	100
22000	5600	185	004	008	010	011	012	012	013	020	100
14000	5600	186	003	007	008	008	009	011	013	018	034
12000	5600	187	003	009	012	012	013	014	016	027	042
10000	5600	188	003	007	007	009	009	011	014	019	032
8000	5600	189	003	005	007	008	008	010	012	018	028
4000	5600	190	004	012	017	017	017	017	020	032	058
2000	5600	191	003	007	008	009	010	012	014	020	036
0000	5600	192	002	006	007	009	009	010	012	026	046
0000	6300	193	002	005	005	006	007	009	011	015	023
2000	6300	194	002	005	007	008	009	010	011	023	030
4000	6300	195	002	005	007	009	009	012	014	018	030
8000	6300	196	002	004	005	006	009	011	012	014	028
10000	6300	197	003	006	008	009	010	012	013	020	036
12000	6300	198	002	005	006	007	009	011	013	018	034
14000	6300	199	005	011	013	014	014	014	016	030	050
22000	6300	200	002	007	009	010	011	012	015	019	030
22000	6700	201	005	007	010	011	011	011	012	020	030
14000	6700	202	002	005	007	008	010	012	014	019	036
12000	6700	203	003	007	010	011	012	014	016	022	034
10000	6700	204	004	008	010	011	011	013	015	022	038
8000	6700	205	002	005	007	008	010	012	014	019	027
4000	6700	206	003	005	007	010	010	010	012	018	030
2000	6700	207	002	004	006	007	008	010	012	016	037
0000	6700	208	002	003	004	006	008	010	011	015	027
0000	7000	209	002	006	007	008	009	010	012	016	027
2000	7000	210	001	003	003	005	005	007	010	015	024
4000	7000	211	002	005	007	008	009	010	014	018	034
8000	7000	212	003	007	008	010	011	012	014	024	034

27 JUNE 58 CONTINUED

POSITION IN CENTIMETERS			STATION									
X	Y	NO.	CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
			0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0	
10000	7000	213	004	013	014	014	014	014	016	030	047	
12000	7000	214	002	004	007	003	010	011	012	016	030	
14000	7000	215	002	006	007	003	009	010	013	020	032	
22000	7000	216	002	008	009	011	012	012	015	022	030	
22000	7500	217	003	005	006	008	010	012	014	020	030	
14000	7500	218	002	007	008	003	010	012	015	026	038	
12000	7500	219	002	004	006	003	009	010	010	013	022	
10000	7500	220	004	008	009	010	010	011	012	019	028	
8000	7500	221	005	008	012	012	013	014	015	024	044	
4000	7500	222	002	005	007	003	009	010	012	019	032	
2000	7500	223	002	006	007	003	008	010	012	016	030	
0000	7500	224	003	007	009	010	011	012	014	024	040	
0000	7900	225	007	010	011	011	011	011	012	020	036	
2000	7900	226	002	006	008	009	009	010	012	016	026	
4000	7900	227	006	010	012	012	012	012	015	028	040	
8000	7900	228	005	011	014	015	016	017	017	022	036	
10000	7900	229	002	005	006	007	009	010	012	017	028	
12000	7900	230	005	010	012	012	013	014	015	024	040	
14000	7900	231	007	010	013	014	014	014	015	025	046	
22000	7900	232	002	005	007	003	009	010	014	020	030	
22000	8300	233	003	005	007	003	009	011	013	022	038	
14000	8300	234	003	007	008	010	011	011	012	020	030	
12000	8300	235	001	003	005	007	009	010	012	016	026	
10000	8300	236	002	004	005	008	010	012	015	020	032	
8000	8300	237	003	008	009	010	011	013	014	020	037	
4000	8300	238	004	006	009	010	011	011	012	020	038	
2000	8300	239	002	006	008	010	011	012	013	019	048	
0000	8300	240	006	012	014	014	014	014	014	028	054	
0000	8700	241	008	012	012	014	014	014	020	042	100	
2000	8700	242	005	013	015	015	016	016	016	030	056	
4000	8700	243	007	014	014	014	014	014	015	027	050	
8000	8700	244	006	008	011	012	012	012	013	022	032	
10000	8700	245	002	004	005	006	008	009	010	015	030	
12000	8700	246	002	006	007	008	008	010	012	018	028	
14000	8700	247	003	007	008	008	008	010	012	019	030	
22000	8700	248	003	006	008	009	010	012	014	019	034	
7500	3500	249	004	012	015	016	017	018	019	100	100	
8400	3000	250	003	010	016	021	026	026	026	028	100	
9400	3500	251	003	006	010	012	014	016	018	100	100	
8400	4000	252	002	010	014	017	018	020	022	100	100	
10700	4500	253	002	009	015	020	023	026	027	027	100	
11600	4000	254	004	008	015	018	018	018	100	100	100	
12500	4500	255	005	013	017	018	018	019	019	100	100	
AVERAGE CI AT EACH DEPTH			003	007	009	012	012	012	016	027	042	

PENETROMETER DATA

29 JUNE 68 RANGE 76 LINE NO. 203

DATA COLLECTED FROM STATION NO. 256-271, 0810 TO 0825 HRS

STATION NO. 272, 1316 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX		READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0			
0100	0200	256	002	004	004	005	006	012	027	038	038			
0700	0200	257	003	010	015	015	016	017	017	021	024			
1300	0200	258	002	006	010	014	018	024	032	042	043			
0100	0400	259	003	008	013	015	015	016	017	026	038			
0700	0400	260	003	014	020	027	032	034	034	037	042			
1300	0400	261	002	005	009	015	024	030	040	058	058			
0100	0600	262	002	007	016	027	030	032	033	036	036			
1300	0600	263	001	003	010	020	023	025	025	042	062			
1300	0800	264	002	004	009	017	022	024	026	025	026			
1300	1000	265	001	003	004	005	009	015	025	025	025			
1300	1200	266	002	007	021	030	033	039	043	046	053			
1300	1400	267	002	005	015	021	027	029	029	029	029			
0100	0800	268	001	002	006	014	020	025	026	026	026			
0100	1000	269	002	005	012	017	020	021	021	021	021			
0100	1200	270	003	010	023	030	042	050	055	072	100			
0100	1400	271	007	014	020	030	037	037	040	068	100			
0800	0300	272	002	006	016	030	045	051	060	087	100			
AVERAGE CI AT EACH DEPTH			002	007	013	020	025	028	032	041	048			

PENETROMETER DATA

30 JUNE 68 RANGE 76 LINE NO. 138

DATA COLLECTED FROM STATION NO. 273-290, 0816 TO 0843 HRS

STATION NO. 291-300, 1114 TO 1123 HRS

STATION NO. 301, 1553 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX		READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0			
0200	0200	273	001	004	010	014	016	018	022	024	025			
0400	0200	274	001	006	012	014	015	016	017	018	024			
0600	0200	275	001	006	009	011	013	015	017	030	048			
0800	0200	276	001	004	007	014	018	022	022	050	056			
1000	0200	277	002	006	012	016	018	018	019	060	079			
1200	0200	278	001	005	012	015	025	034	043	060	078			
1400	0200	279	001	005	016	023	026	033	035	041	042			
0200	0400	280	001	008	013	017	018	018	019	020	039			
0400	0400	281	003	008	012	014	017	019	020	025	030			
0600	0400	282	003	010	015	019	027	033	037	049	054			
0800	0400	283	002	004	006	023	032	042	048	075	068			
1000	0400	284	002	006	012	015	029	034	044	073	084			
1200	0400	285	002	005	016	025	033	044	052	055	059			
1400	0400	286	002	007	013	022	028	036	046	067	067			
0200	0600	287	002	009	019	027	030	034	036	042	042			
0200	0800	288	002	005	013	025	030	030	030	030	030			
1400	0600	289	001	008	016	020	026	030	032	058	074			
1400	0800	290	002	010	019	024	027	029	030	030	030			
0800	0400	291	002	010	018	030	040	050	060	082	100			
1000	0400	292	002	004	010	024	036	052	062	090	100			
1200	0400	293	004	007	014	020	025	025	025	030	030			
1400	0400	294	002	006	014	020	024	029	045	062	062			
1400	0600	295	003	007	009	015	022	025	060	070	070			
1200	0600	296	003	006	010	012	020	026	030	048	065			
1000	0600	297	003	003	010	015	016	040	050	080	080			
0800	0600	298	004	009	016	023	031	040	057	059	059			
1400	0800	299	001	007	016	028	037	041	041	041	041			
1400	1000	300	003	008	015	021	026	028	029	029	029			
0800	0700	301	002	007	012	020	026	034	040	050	050			
AVERAGE CI AT EACH DEPTH			002	007	013	020	025	031	037	050	056			

PENETROMETER DATA

5 JULY 54 RANGE 76 LINE NO. 68
 DATA COLLECTED FROM STATION NO. 302-305, 0956 TC 1003 HRS
 STATION NO. 306-310, 0925 TO 0937 HRS
 STATION NO. 311-316, 1325 TO 1329 HRS
 STATION NO. 317-321, 1415 TO 1422 HRS
 STATION NO. 322-326, 1505 TC 1509 HRS

PENETROMETER WITH 0-100 JIAL GAGE AND 3.22 SO CM CONE

POSITION IN CENTIMETERS			STATION	CONE INDEX		READINGS		AT DEPTHS IN CENTIMETERS						
X	Y	NO.		0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0		
0150	0150	302	001	001	004	025	034	042	049	049	050			
0250	0150	303	001	003	005	013	019	021	024	026	034			
0150	0050	304	001	004	024	037	044	046	046	046	046			
0050	0150	305	001	003	018	033	036	038	038	038	038			
0150	0250	306	001	004	016	025	029	030	032	032	032			
0150	0150	307	001	005	008	013	018	022	025	030	036			
0250	0150	308	002	012	020	026	030	034	038	037	037			
0150	0050	309	001	010	018	033	038	042	045	045	045			
0050	0150	310	002	002	016	022	026	028	029	034	036			
0150	0250	311	002	008	018	024	026	030	034	040	046			
0150	0150	312	001	003	005	010	019	021	021	021	021			
0250	0150	313	001	006	013	023	030	036	040	042	046			
0150	0050	314	001	005	008	013	035	046	050	055	057			
0050	0150	315	002	003	004	009	027	043	048	053	053			
0150	0250	316	001	005	018	035	048	053	055	063	072			
0150	0150	317	001	003	005	013	028	031	032	032	032			
0250	0150	318	002	004	005	012	026	037	045	066	060			
0150	0050	319	001	007	016	034	047	054	059	070	075			
0050	0150	320	001	005	009	024	039	052	058	070	075			
0150	0250	321	001	004	016	029	044	065	076	093	096			
0150	0150	322	001	002	003	007	015	020	025	025	025			
0250	0150	323	001	003	010	025	035	043	050	062	076			
0150	0050	324	001	005	010	022	032	034	034	040	070			
0050	0150	325	001	004	007	022	035	045	051	058	080			
0150	0250	326	001	004	007	016	044	061	070	076	088			
AVERAGE CI AT EACH DEPTH			001	005	011	022	032	039	043	048	053			

PENETROMETER DATA

11 JULY 68 RANGE 72 LINE NO. 223

DATA COLLECTED FROM STATION NO. 327-374, 1208 TO 1255 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SO CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS					
X	Y	NO.	0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
3200	6600	327	006	008	008	009	010	012	014	017	100	
3900	6600	328	004	006	007	009	010	011	014	016	100	
4600	6600	329	007	009	009	009	010	013	016	020	100	
5200	6600	330	006	009	009	010	010	012	015	020	075	
5800	6600	331	009	010	010	011	012	014	016	025	100	
6400	6600	332	006	012	013	013	013	015	017	025	080	
7000	6600	333	006	012	013	013	013	013	015	024	100	
7300	6600	334	007	011	012	013	013	015	018	025	100	
7300	7000	335	007	012	014	015	015	016	016	024	047	
7000	7000	336	006	010	012	012	013	013	015	022	047	
6400	7000	337	007	011	013	013	014	015	015	024	085	
5800	7000	338	007	010	011	011	011	012	015	020	090	
5200	7000	339	005	008	009	009	009	010	012	019	036	
4600	7000	340	005	008	008	008	009	011	014	019	070	
3800	7000	341	005	007	008	008	008	010	014	015	043	
3200	7000	342	006	009	009	010	010	011	013	019	062	
3200	7400	343	006	008	009	009	009	010	013	017	029	
3800	7400	344	005	007	008	009	010	011	013	016	053	
4600	7400	345	005	007	008	009	010	011	013	015	045	
5200	7400	346	005	009	009	009	010	011	013	015	034	
5800	7400	347	005	009	009	009	010	011	014	021	037	
6400	7400	348	005	009	009	010	011	012	014	020	048	
7000	7400	349	004	007	009	010	011	013	017	021	034	
7300	7400	350	005	010	010	010	011	013	015	021	043	
7300	7800	351	004	009	010	010	010	010	012	016	054	
7000	7800	352	003	007	011	011	011	011	011	014	027	
6400	7800	353	005	007	008	009	009	011	013	017	034	
5800	7800	354	007	011	011	012	013	013	016	021	042	
5200	7800	355	007	010	010	010	010	012	014	020	040	
4600	7800	356	008	011	011	011	011	013	015	021	039	
3800	7800	357	005	009	010	010	011	013	015	020	050	
3200	7800	358	004	010	010	011	011	013	015	020	037	
3200	8200	359	005	010	010	010	010	010	013	021	046	
3800	8200	360	006	010	010	010	011	013	015	022	047	
4600	8200	361	007	012	012	012	012	012	015	021	050	
5200	8200	362	006	010	011	011	011	013	015	018	050	
5800	8200	363	005	009	010	010	010	012	015	019	050	
6400	8200	364	006	009	009	009	010	012	013	017	044	
7000	8200	365	004	006	007	008	009	011	013	016	040	
7300	8200	366	005	007	008	009	010	012	013	016	070	
7300	8600	367	004	014	015	015	015	016	018	028	072	
7000	8600	368	010	013	015	015	016	017	018	027	100	
6400	8600	369	006	012	015	015	015	016	018	029	095	
5800	8600	370	007	011	011	011	012	014	016	025	100	
5200	8600	371	005	007	008	009	010	012	013	019	100	
4600	8600	372	003	006	008	009	010	011	013	017	054	
3800	8600	373	005	007	009	010	011	011	012	015	100	
3200	8600	374	005	007	010	011	011	012	013	015	078	
AVERAGE 21 AT EACH DEPTH			006	009	010	011	011	012	015	024	062	

PENETROMETER DATA

25 JULY 68 RANGE 72 LINE NO. 223

DATA COLLECTED FROM STATION NO. 375-424, 0931 TO 1035 HRS

PENETROMETER WITH 0-100 LIAL GAGE AND 3.22 SO CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
3200	6600	375	001	003	006	005	006	006	006	010	072	
4000	6600	376	001	005	008	009	008	008	009	011	100	
5700	6600	377	001	003	005	006	007	007	009	013	085	
7400	6600	378	003	006	006	007	009	012	012	017	100	
9100	6600	379	003	005	006	006	009	011	013	017	100	
9100	6800	380	002	010	013	013	013	013	015	022	065	
7400	6800	381	006	013	016	015	016	016	017	026	100	
5700	6800	382	005	012	013	013	013	016	021	031	070	
4000	6800	383	009	018	018	019	020	023	025	035	100	
3200	6800	384	003	007	008	009	009	011	013	014	077	
3200	7000	385	012	013	013	013	013	014	015	020	097	
4000	7000	386	005	010	012	012	014	016	016	025	100	
5700	7000	387	008	013	013	013	013	014	017	031	100	
7400	7000	388	005	009	010	010	011	014	016	022	100	
9100	7000	389	007	013	013	014	015	018	020	028	100	
9100	7200	390	004	006	008	010	010	012	012	016	100	
7400	7200	391	004	006	008	010	012	014	016	022	100	
5700	7200	392	003	004	007	010	010	012	014	021	064	
4000	7200	393	004	008	008	010	012	015	019	026	100	
3200	7200	394	006	009	010	011	011	012	015	024	100	
3200	7400	395	003	007	008	009	009	010	012	017	100	
4000	7400	396	006	009	010	010	011	013	015	022	100	
5700	7400	397	003	010	012	012	013	015	018	032	100	
7400	7400	398	015	015	015	015	015	015	015	023	100	
9100	7400	399	005	007	008	009	009	011	014	022	100	
9100	7600	400	004	008	008	010	011	012	014	018	082	
7400	7600	401	006	013	013	013	016	016	020	028	100	
5700	7600	402	007	011	012	013	015	017	020	026	090	
4000	7600	403	004	005	007	010	011	011	012	018	090	
3200	7600	404	001	005	007	007	007	008	008	014	100	
3200	7800	405	005	010	010	010	012	014	015	024	100	
4000	7800	406	010	011	012	012	012	015	018	026	100	
5700	7800	407	009	015	015	015	015	017	021	030	100	
7400	7800	408	007	011	013	014	015	016	020	028	053	
9100	7800	409	006	010	012	012	012	014	018	034	100	
9100	8000	410	005	008	011	013	014	016	018	023	085	
7400	8000	411	004	010	012	014	017	018	018	027	100	
5700	8000	412	005	008	010	011	011	012	014	018	100	
4000	8000	413	005	007	009	011	012	012	013	019	086	
3200	8000	414	003	005	008	010	012	012	016	020	100	
3200	8200	415	007	013	013	013	013	014	016	022	100	
4000	8200	416	011	012	012	012	014	017	021	033	100	
5700	8200	417	005	007	009	010	012	012	012	025	100	
7400	8200	418	006	011	012	013	016	018	023	035	100	
9100	8200	419	005	014	014	014	014	015	019	028	100	
9100	8400	420	010	012	013	013	013	015	017	020	100	
7400	8400	421	006	013	013	014	016	020	021	050	100	
5700	8400	422	010	012	012	012	015	015	018	040	100	
4000	8400	423	008	011	011	011	013	015	020	034	100	
3200	8400	424	006	011	012	012	014	017	027	050	100	
AVERAGE CI AT EACH DEPTH			006	009	011	011	012	014	017	025	095	

PENETROMETER DATA

31 JULY 68 PAGE 72 LINE NO. 223

DATA COLLECTED FROM STATION NO. 425-460, 1535 TO 1610 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.0	30.0	
3200	6400	425	001	002	003	004	005	006	008	010	026	
3800	6400	426	001	002	004	004	005	006	008	010	018	
4400	6400	427	002	003	004	005	006	008	010	012	016	
5000	6400	428	001	002	004	005	006	008	008	008	015	
5600	6400	429	002	003	004	006	006	008	009	015	024	
6200	6400	430	002	003	005	006	008	009	011	014	022	
6200	6800	431	002	004	005	008	008	010	012	013	036	
5600	6800	432	006	008	008	008	009	010	012	014	024	
5000	6800	433	003	005	007	009	009	010	012	021	070	
4400	6800	434	003	006	008	009	009	010	012	018	024	
3800	6800	435	003	005	006	008	008	009	010	015	050	
3200	6800	436	003	005	006	009	008	010	011	012	028	
3200	7200	437	001	002	003	004	005	006	008	011	016	
3800	7200	438	002	004	006	008	008	009	011	015	020	
4400	7200	439	002	004	006	008	009	010	012	014	018	
5000	7200	440	002	004	005	008	009	010	011	013	021	
5600	7200	441	002	003	004	006	008	009	010	012	016	
6200	7200	442	002	004	005	006	008	010	011	015	021	
6200	7600	443	003	004	004	005	006	008	010	011	016	
5600	7600	444	002	003	003	004	005	008	008	014	030	
5000	7600	445	002	003	004	005	008	008	010	012	020	
4400	7600	446	002	004	006	008	009	010	010	014	100	
3800	7600	447	003	006	006	006	008	010	011	018	090	
3200	7600	448	002	009	009	009	009	010	011	020	090	
3200	7600	449	002	003	006	008	009	010	010	018	020	
3800	7600	450	002	003	005	006	008	009	010	014	020	
4400	7600	451	002	003	004	008	009	010	012	014	022	
5000	7600	452	002	004	006	008	010	011	012	014	020	
5600	7600	453	002	004	005	006	009	010	012	018	022	
6200	7600	454	002	004	005	008	009	010	011	014	016	
6200	8400	455	002	004	005	006	008	010	012	015	070	
5600	8400	456	002	004	006	006	008	009	011	015	070	
5000	8400	457	002	004	006	009	012	014	016	020	090	
4400	8400	458	002	005	009	009	010	011	012	020	030	
3800	8400	459	003	005	006	009	009	011	014	018	038	
3200	8400	460	003	005	006	008	009	011	012	018	080	
AVERAGE CI AT EACH DEPTH			004	006	007	007	008	010	011	016	036	

PENETROMETER DATA

1 AUG 64 RANGE 72 LINE NO. 223
 DATA COLLECTED FROM STATION NO. 461-496, 0950 TO 1025 HRS
 STATION NO. 497-508, 1139 TO 1150 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS					
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
3200	6400	461	001	003	004	004	005	006	009	012	020	
3800	6400	462	001	002	003	004	006	008	009	012	022	
4400	6400	463	001	002	004	009	012	015	018	019	022	
5000	6400	464	002	003	005	008	010	012	012	014	024	
5600	6400	465	002	004	005	005	010	012	012	014	024	
6200	6400	466	002	004	006	008	010	012	012	014	024	
6200	6800	467	006	013	014	014	014	014	014	018	040	
5600	6800	468	008	010	012	013	013	014	015	022	042	
5000	6800	469	006	010	013	013	013	013	014	020	048	
4400	6800	470	004	007	008	008	009	010	012	018	028	
3800	6800	471	005	008	010	010	010	012	012	021	036	
3200	6800	472	004	009	010	011	011	011	012	018	031	
3200	7200	473	003	008	010	010	010	012	014	021	032	
3800	7200	474	005	008	011	012	012	013	015	024	038	
4400	7200	475	004	008	009	010	010	012	015	024	044	
5000	7200	476	003	005	010	012	012	013	014	016	046	
5600	7200	477	003	008	010	011	011	012	013	022	039	
6200	7200	478	003	008	010	012	012	012	015	022	036	
6200	7600	479	002	004	005	007	009	011	012	014	019	
5600	7600	480	003	005	006	008	008	009	011	015	021	
5000	7600	481	001	003	004	006	008	010	012	014	018	
4400	7600	482	002	005	006	007	008	009	010	011	016	
3800	7600	483	002	005	006	008	008	009	010	011	020	
3200	7600	484	001	003	004	006	008	010	012	014	018	
3200	8000	485	002	006	008	010	012	012	014	021	034	
3800	8000	486	003	005	010	012	012	014	018	022	035	
4400	8000	487	003	008	010	012	012	014	015	024	038	
5000	8000	488	003	008	010	012	014	015	016	022	038	
5600	8000	489	003	008	009	010	011	012	014	021	038	
6200	8000	490	002	005	008	010	011	012	014	022	030	
6200	8400	491	002	003	005	006	008	009	011	014	028	
5600	8400	492	002	004	005	008	009	010	012	014	025	
5000	8400	493	002	004	008	010	011	013	015	022	032	
4400	8400	494	003	005	007	009	010	011	013	019	028	
3800	8400	495	004	008	009	009	010	011	013	018	024	
3200	8400	496	004	008	010	010	011	012	014	021	031	
3200	5200	497	003	006	008	003	008	010	012	020	035	
3800	5200	498	004	010	011	012	012	013	015	018	032	
4400	5200	499	004	006	008	010	011	011	012	015	032	
5000	5200	500	003	005	009	011	012	014	020	025	042	
5600	5200	501	004	009	010	012	012	013	014	021	042	
6200	5200	502	004	011	012	014	015	020	024	038	095	
6200	5600	503	006	009	012	014	014	015	020	028	060	
5600	5600	504	004	009	011	012	013	014	016	028	042	
5000	5600	505	001	004	008	010	014	015	015	020	038	
4400	5600	506	002	004	008	010	012	014	015	021	060	
3800	5600	507	002	006	009	010	012	014	016	022	060	
3200	5600	508	004	005	010	014	018	022	024	030	092	
AVERAGE CI AT EACH DEPTH			003	006	008	010	011	012	014	020	036	

PENETROMETER DATA

5 NOV 69 RANGE 72 LINE NO. 223
DATA COLLECTED FROM STATION NO. 509-580, 1119 TO 1230 MRS
PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS				
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0
2900	6000	509	002	007	009	010	013	019	025	032	076
3400	6600	510	004	009	010	012	015	018	023	033	080
3900	6600	511	004	004	009	010	013	016	023	032	090
4400	6600	512	003	005	008	009	011	017	020	030	090
4900	6600	513	004	006	008	010	012	014	022	032	064
5400	6600	514	003	005	007	009	010	016	021	027	072
5400	6900	515	005	009	011	012	013	017	021	035	096
4900	6900	516	006	010	011	012	013	015	018	039	076
4400	6900	517	006	009	011	012	014	019	024	036	074
3900	6900	518	005	010	011	013	016	020	025	039	080
3400	6900	519	005	008	009	010	012	014	019	030	072
2900	6900	520	005	008	009	010	010	013	016	026	062
2900	7200	521	001	003	005	007	009	012	015	020	030
3400	7200	522	002	005	006	009	010	013	015	022	036
3900	7200	523	002	004	005	006	008	011	013	020	026
4400	7200	524	001	003	005	008	010	012	012	012	026
4900	7200	525	001	003	005	007	009	011	012	017	100
5400	7200	526	002	005	007	010	015	022	026	044	100
5400	7500	527	004	007	008	009	010	013	017	025	066
4900	7500	528	003	005	006	007	009	011	014	022	042
4400	7500	529	002	003	005	007	009	011	013	020	035
3900	7500	530	003	006	007	008	009	011	014	022	046
3400	7500	531	003	005	007	009	009	011	015	024	040
2900	7500	532	002	003	006	007	009	012	015	020	052
2900	7800	533	003	005	009	010	011	012	020	030	082
3400	7800	534	003	005	008	009	010	010	013	025	037
3900	7800	535	001	002	004	006	006	008	010	013	072
4400	7800	536	002	004	005	006	007	008	013	022	080
4900	7800	537	004	008	009	010	011	013	016	032	080
5400	7800	538	002	003	005	006	009	011	013	022	034
5400	8100	539	002	004	004	005	006	008	009	014	024
4900	8100	540	004	008	009	009	010	013	018	034	048
4400	8100	541	005	009	010	011	013	015	019	039	100
3900	8100	542	003	006	008	009	010	012	015	024	074
3400	8100	543	004	005	008	009	010	013	017	025	086
2900	8100	544	004	007	009	009	009	012	014	023	066
2900	8400	545	003	009	009	010	012	014	019	030	100
3400	8400	546	006	010	011	012	014	019	024	048	100
3900	8400	547	005	010	011	013	016	023	029	044	100
4400	8400	548	003	005	007	008	009	011	018	024	066
4900	8400	549	004	008	010	011	012	016	020	029	080
5400	8400	550	003	005	009	010	011	015	020	030	072
5400	8700	551	004	008	010	012	015	020	025	039	100
4900	8700	552	006	010	011	013	014	018	025	050	100
4400	8700	553	003	009	012	015	020	024	028	048	100
3900	8700	554	004	009	010	012	015	020	027	044	100
3400	8700	555	003	007	009	011	013	018	025	038	100
2900	8700	556	005	010	011	012	014	017	022	036	100
2900	9000	557	003	005	007	008	009	011	013	023	082
3400	9000	558	004	009	007	008	009	012	015	027	076
3900	9000	559	003	007	008	009	009	012	017	028	092
4400	9000	560	005	007	009	009	010	012	015	028	072
4900	9000	561	003	008	009	010	010	012	015	024	070
5400	9000	562	005	008	010	010	011	012	016	030	082

5 NOV 61 CONTINUED

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0	
5400	9300	563	004	009	010	013	015	020	027	052	100	
4900	9300	564	004	008	010	011	013	017	022	042	100	
4600	9300	565	003	008	010	011	013	017	019	044	076	
3900	9300	566	005	009	009	010	012	015	022	040	080	
3400	9300	567	003	007	009	011	013	017	023	037	077	
2900	9300	568	003	007	009	013	012	016	021	040	080	
2900	9600	569	005	009	010	010	012	015	020	030	076	
3400	9500	570	003	009	010	011	012	014	018	027	082	
3900	9500	571	003	008	009	009	010	013	017	030	076	
4400	9500	572	004	008	009	009	010	013	017	028	060	
4900	9600	573	004	008	009	013	011	014	016	029	070	
5400	9600	574	005	008	008	010	011	014	019	030	070	
5400	9900	575	001	003	005	007	009	012	015	021	100	
4900	9300	576	003	005	007	007	009	012	014	028	072	
4400	9300	577	002	003	004	006	008	012	014	023	090	
3900	9300	578	002	004	005	005	009	012	014	021	054	
3400	9300	579	001	003	004	005	008	011	014	019	046	
2900	9300	580	001	001	002	003	005	007	009	012	070	
AVERAGE CI AT EACH DEPTH			003	007	008	009	011	014	018	030	073	

PENETROMETER DATA

14 NOV 61 RANGE 72 LINE NO. 223

DATA COLLECTED FROM STATION NO. 581-589, 1202 TO 1210 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
4400	6600	581	004	008	010	010	012	014	022	032	040	
4900	6600	582	004	009	010	011	014	018	022	028	038	
5400	6600	583	004	007	008	010	012	015	019	027	034	
5400	6900	584	006	014	014	014	015	019	024	034	058	
4900	6900	585	004	011	014	016	019	023	026	033	050	
4400	6900	586	006	009	010	011	013	019	022	028	042	
4400	7200	587	003	004	008	011	012	016	016	023	026	
4900	7200	588	002	004	006	009	010	013	015	020	023	
5400	7200	589	002	003	008	011	012	013	015	019	022	
AVERAGE CI AT EACH DEPTH			004	008	011	012	013	017	020	027	037	

PENETROMETER DATA

21 NOV 61 RANGE 72 LINE NO. 223

DATA COLLECTED FROM STATION NO. 590-661, 1335 TC 1446 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
2900	6600	590	001	003	005	005	007	008	009	014	038	
3400	6600	591	006	009	008	009	010	010	012	020	043	
3900	6600	592	004	006	007	007	007	008	009	014	034	
4400	6600	593	002	004	004	005	005	006	007	015	050	
4900	6600	594	001	002	002	003	004	004	006	012	026	
5400	6600	595	001	002	003	004	004	005	005	010	024	
5400	6900	596	004	007	009	011	011	012	015	020	082	
4900	6900	597	003	005	008	010	011	012	014	020	076	
4400	6900	598	004	006	007	009	010	011	012	024	076	
3900	6900	599	006	011	012	013	014	015	017	040	078	
3400	6900	600	011	019	025	029	028	028	030	050	072	
2900	6900	601	008	012	013	016	022	025	030	046	030	
2900	7200	602	002	003	004	004	004	005	006	012	024	
3400	7200	603	001	004	004	004	004	007	010	014	025	
3900	7200	604	002	004	004	004	004	004	006	012	025	
4400	7200	605	001	004	004	004	004	004	005	011	022	
4900	7200	606	003	005	008	010	010	010	010	016	025	
5400	7200	607	002	007	009	010	010	012	012	016	025	
5400	7500	608	005	007	009	009	011	013	015	020	029	
4900	7500	609	006	010	011	012	012	012	015	024	037	
4400	7500	610	006	007	009	010	011	012	015	022	030	
3900	7500	611	005	007	008	009	010	014	014	018	024	
3400	7500	612	003	007	009	010	012	013	015	024	032	
2900	7500	613	005	008	008	009	010	013	017	023	032	
2900	7800	614	005	012	014	015	016	018	023	043	054	
3400	7800	615	006	011	013	015	016	017	020	032	051	
3900	7800	616	004	010	012	015	016	020	024	028	032	
4400	7800	617	008	012	012	013	014	017	020	032	045	
4900	7800	618	006	013	014	014	015	016	019	032	044	
5400	7800	619	007	010	012	013	013	015	019	027	042	
5400	8100	620	001	002	005	007	007	008	010	014	022	
4900	8100	621	002	004	005	007	009	012	013	015	025	
4400	8100	622	004	006	009	010	011	014	015	022	029	
3900	8100	623	002	003	004	006	008	009	010	013	022	
3400	8100	624	003	004	005	006	008	010	012	016	021	
2900	8100	625	005	008	008	009	010	012	014	019	026	
2900	8400	626	008	011	011	012	013	015	018	027	042	
3400	8400	627	014	016	016	017	018	021	026	042	062	
3900	8400	628	014	018	018	020	022	027	036	053	070	
4400	8400	629	017	022	022	022	022	023	030	049	070	
4900	8400	630	016	020	020	020	020	022	027	041	058	
5400	8400	631	016	019	019	020	020	020	020	035	045	
5400	8700	632	006	010	010	012	013	015	020	026	035	
4900	8700	633	006	011	011	012	013	016	019	028	039	
4400	8700	634	006	012	014	015	019	024	027	038	046	
3900	8700	635	009	012	014	014	016	020	023	031	048	
3400	8700	636	010	013	014	014	015	018	022	036	050	
2900	8700	637	006	012	012	013	014	017	020	027	039	
2900	9000	638	001	002	003	005	006	006	007	012	021	
3400	9000	639	004	007	007	007	008	010	012	016	026	
3900	9000	640	003	006	006	008	009	010	011	017	023	
4400	9000	641	003	005	006	008	009	012	013	019	026	
4900	9000	642	003	007	009	010	011	012	013	018	029	
5400	9000	643	004	006	007	009	010	010	012	018	026	

21 NOV 63 CONTINUED

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0	
5400	9300	644	003	006	007	007	008	010	014	019	030	
4900	9300	645	003	006	008	009	010	012	012	020	025	
4400	9300	646	004	007	008	010	011	012	012	014	025	
3900	9300	647	002	005	006	007	008	010	010	015	025	
3400	9300	648	003	006	007	008	010	011	012	017	024	
2900	9300	649	005	009	010	010	012	014	024	032	040	
2900	9600	650	003	005	005	006	007	008	010	016	027	
3400	9600	651	004	007	008	009	010	011	013	018	029	
3900	9600	652	006	011	012	013	014	015	016	028	040	
4400	9600	653	006	010	010	012	013	014	016	024	034	
4900	9600	654	003	007	008	009	010	012	014	020	026	
5400	9600	655	004	007	008	010	012	013	014	019	025	
5400	9900	656	004	007	008	010	012	013	013	017	026	
4900	9900	657	003	007	008	009	010	012	014	019	027	
4400	9900	658	007	009	010	010	012	013	015	020	026	
3900	9900	659	006	010	011	011	011	012	015	016	033	
3400	9900	660	002	004	006	008	009	009	010	014	022	
2900	9900	661	004	005	006	009	012	014	014	016	024	
AVERAGE CI AT EACH DEPTH			005	008	009	010	012	013	015	023	037	

PENETROMETER DATA

26 NOV 63 RANGE 72 LINE NO. 223

DATA COLLECTED FROM 1229 TO 1305 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
2600	6000	662	006	009	010	011	012	013	014	020	034	
2900	6600	663	006	009	010	011	014	016	019	026	043	
3400	6600	664	005	008	009	010	012	015	016	022	029	
3900	6600	665	003	006	007	010	011	012	013	021	027	
4400	6600	666	004	007	009	010	012	014	015	022	039	
4900	6600	667	006	009	009	010	012	014	017	023	035	
5400	6600	668	007	012	013	015	019	022	027	042	056	
5700	6600	669	009	013	014	015	017	020	024	040	062	
5700	6900	670	010	012	013	014	016	019	025	046	060	
5400	6900	671	009	013	015	017	020	023	028	046	060	
4900	6900	672	007	012	013	015	017	020	025	036	043	
4400	6900	673	006	011	012	014	018	022	026	032	052	
3900	6900	674	006	009	010	012	016	019	023	027	037	
3400	6900	675	004	009	011	013	016	019	023	028	039	
2900	6900	676	004	008	009	012	013	014	017	028	043	
2600	6900	677	008	011	012	012	014	016	020	033	041	
2600	7200	678	007	011	012	014	016	019	023	032	051	
2900	7200	679	006	010	011	013	015	017	020	026	042	
3400	7200	680	006	009	009	010	012	013	016	023	042	
3900	7200	681	006	011	012	014	016	018	022	033	056	
4400	7200	682	006	010	010	011	012	014	018	027	036	
4900	7200	683	008	012	012	012	015	015	016	025	048	
5400	7200	684	008	013	013	014	015	020	026	035	048	
5700	7200	685	007	010	010	012	013	016	018	027	056	
5700	7500	686	010	014	015	018	020	022	027	038	056	
5400	7500	687	006	011	012	013	014	016	019	030	047	
4900	7500	688	008	012	013	014	015	017	021	032	052	
4400	7500	689	009	014	016	017	018	018	023	039	052	
3900	7500	690	009	012	012	014	016	019	022	034	050	
3400	7500	691	009	013	015	015	016	018	022	042	059	
2900	7500	692	009	013	013	014	015	017	020	033	100	
2600	7500	693	009	014	016	017	019	023	027	044	070	
AVERAGE CI AT EACH DEPTH			007	011	012	013	016	018	021	032	059	

PENETROMETER DATA

25 FEB 63 RANGE 76 LINE NO. 227

DATA COLLECTED FROM 0925 TO 1150 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS			STATION	CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.		0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
0500	0500	694		001	004	015	025	032	033	036	036	070	
0500	0600	695		001	012	030	050	072	082	085	085	085	
0500	0500	696		001	009	030	050	070	080	090	100	130	
0500	0430	697		001	009	036	055	072	084	090	090	090	
0400	0500	698		001	013	032	047	056	061	068	068	068	
0500	0500	699		001	008	013	015	019	022	025	028	028	
0500	0500	700		001	005	011	013	025	035	048	068	090	
0500	0500	701		001	006	009	012	012	012	012	012	012	
0500	0500	702		001	003	006	013	020	022	023	027	060	
AVERAGE CI AT EACH DEPTH				001	008	020	032	042	048	053	057	067	

PENETROMETER DATA

28 FEB 63 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 0917 TO 0931 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS			STATION	CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.		0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
8100	2300	703		001	004	007	008	008	008	008	012	021	
8900	2300	704		002	007	009	010	011	014	016	025	034	
8500	2100	705		002	005	006	009	010	011	012	016	027	
8500	2500	706		006	011	012	013	014	016	020	039	056	
8800	2200	707		001	004	008	013	017	019	019	021	024	
9500	2200	708		003	009	012	013	014	015	017	030	038	
9200	2000	709		003	007	011	012	014	015	016	024	040	
9200	2400	710		003	008	009	010	012	014	016	023	034	
AVERAGE CI AT EACH DEPTH				003	007	009	011	013	014	016	024	034	

PENETROMETER DATA

4 MAR 63 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1055 TO 1108 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS			STATION	CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.		0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
5500	5500	711		007	012	013	013	014	017	020	030	048	
5800	5200	712		006	016	017	017	017	017	018	036	052	
6200	5500	713		009	015	016	016	018	018	024	044	054	
5800	5900	714		009	020	020	020	020	020	024	050	064	
4700	6700	715		023	023	023	023	023	023	023	030	048	
5000	6300	716		007	017	017	019	019	019	024	042	064	
5400	6700	717		011	016	016	017	021	026	028	032	054	
5000	7100	718		011	016	018	020	020	020	024	037	061	
AVERAGE CI AT EACH DEPTH				010	017	018	018	019	020	023	038	056	

PENETROMETER DATA

10 MAR 63 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1240 TO 1243 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS			STATION	CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.		0.0	2.5	5.0	7.5	10.5	12.5	15.5	22.5	30.0	
2400	8200	719		005	008	011	012	016	020	024	037	090	
3000	7900	720		002	008	010	013	019	023	027	042	078	
3300	8200	721		003	009	011	013	015	017	020	036	084	
3000	8300	722		005	012	013	015	016	019	025	042	054	
AVERAGE CI AT EACH DEPTH				004	009	011	013	017	020	024	039	077	

PENETROMETER DATA

14 MAR 69 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM STATION NO. 723-742, 1139 TO 1219 HRS

STATION NO. 743-778, 1606 TO 1645 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0	
1500	2100	723	006	008	009	010	012	014	016	020	020	044
1700	1900	724	006	008	009	010	012	013	014	018	020	044
1900	2100	725	007	009	010	012	013	014	018	025	025	048
1700	2300	726	003	004	004	005	008	010	012	012	012	034
10600	3200	727	006	010	011	012	014	015	016	018	018	048
10800	3000	728	004	006	008	008	010	012	013	014	014	026
11000	3200	729	005	010	012	014	015	018	020	030	030	051
10800	3400	730	005	008	012	014	016	020	022	032	032	050
11300	3300	731	006	010	011	011	013	015	018	025	025	038
11500	3100	732	005	010	011	012	015	020	022	038	038	052
11700	3300	733	005	008	009	010	012	017	019	022	022	038
11500	3500	734	006	010	013	015	018	020	021	024	024	050
8000	3000	735	004	009	009	010	011	012	016	024	024	048
8200	3600	736	006	008	009	010	012	020	022	028	028	042
8400	3800	737	004	006	008	009	010	015	017	022	022	038
6200	4000	738	006	010	011	012	013	016	019	024	024	054
10200	4800	739	004	005	008	010	012	018	020	025	025	032
10400	4600	740	005	009	009	012	013	015	018	024	024	042
10600	4800	741	006	009	010	012	014	018	020	022	022	036
10400	5000	742	004	005	006	008	010	014	017	020	020	030
9000	2700	743	004	005	007	009	010	015	024	028	028	038
9200	2500	744	006	008	009	010	012	014	015	019	019	034
9400	2700	745	005	008	010	010	011	012	018	024	024	040
9200	2900	746	004	006	009	010	010	012	015	024	024	034
12000	3300	747	008	010	014	015	020	024	030	038	038	100
12200	3100	748	006	010	012	014	015	018	020	025	025	044
12400	3300	749	006	012	014	016	020	024	030	040	040	060
12200	3500	750	018	018	018	018	018	018	018	020	020	050
10600	4400	751	006	010	011	012	014	018	028	030	030	042
10800	4200	752	009	011	012	014	015	018	020	024	024	035
11000	4400	753	006	009	010	012	014	015	018	024	024	032
10800	4600	754	004	008	010	012	014	018	025	030	030	042
5200	4100	755	006	014	014	015	018	022	024	028	028	058
5400	3900	756	006	008	010	012	014	022	024	026	026	038
5600	4100	757	006	009	012	014	016	018	020	025	025	052
5400	4300	758	010	012	014	018	020	022	026	038	038	060
6300	5100	759	006	010	014	014	018	020	025	026	026	038
6500	4900	760	006	010	012	012	013	014	018	025	025	038
6700	5100	761	006	008	010	014	018	020	024	028	028	032
6500	5300	762	004	006	008	010	012	014	016	022	022	036
11900	4900	763	004	006	008	010	012	014	018	024	024	036
12100	4700	764	004	008	010	012	014	018	020	022	022	052
12300	4900	765	005	009	010	010	011	012	014	024	024	042
12100	5100	766	004	008	010	011	012	014	018	024	024	048
5000	6900	767	010	010	012	015	024	028	038	034	034	046
5200	6700	768	004	005	005	009	010	010	012	014	014	028
5400	6900	769	008	012	014	018	019	024	028	034	034	048
5200	7100	770	006	009	012	013	014	018	024	030	030	050
5600	8000	771	004	010	011	012	014	018	022	025	025	048
5900	7700	772	005	007	009	010	011	015	018	024	024	040
6200	8000	773	006	008	010	012	013	016	020	022	022	042
5900	8300	774	008	010	011	012	016	020	024	032	032	060
11600	7900	775	006	009	010	012	014	016	019	024	024	040

14 MAR 69 CONTINUED

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.0	22.5	30.0	
11800	7700	776	006	008	009	010	015	022	024	030	050	
12000	7900	777	004	008	010	012	014	016	018	024	048	
11800	8100	778	006	008	010	013	015	018	024	028	050	
AVERAGE CI AT EACH DEPTH			007	009	010	013	014	017	020	026	045	

PENETROMETER DATA

25 MAR 69 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1405 TO 1503 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
5900	5100	779	014	014	014	014	015	017	019	025	036	
6180	4700	780	003	005	006	007	008	011	013	018	023	
6600	5100	781	007	013	014	016	020	023	026	032	040	
6100	5300	782	005	010	011	012	014	016	020	032	044	
7600	4500	783	007	011	011	012	013	015	018	024	035	
7900	4300	784	002	010	010	011	012	014	016	25	035	
8300	4500	785	006	013	015	017	018	021	024	033	040	
8380	5100	786	008	014	017	021	026	028	029	032	042	
7900	5500	787	008	013	016	023	027	028	030	034	038	
7600	5100	788	011	012	013	015	018	022	024	031	044	
9600	3500	789	013	015	015	015	015	022	027	038	053	
9900	2900	790	009	011	011	012	013	014	016	028	031	
10500	3300	791	009	011	012	013	015	018	020	022	030	
9900	3900	792	006	012	015	018	020	024	031	040	062	
12200	3500	793	015	015	015	015	018	021	023	026	037	
12500	3100	794	008	010	011	011	011	013	014	022	028	
12900	3500	795	008	009	010	012	014	015	016	023	033	
12500	3900	796	015	017	017	017	017	018	022	024	033	
11900	6300	797	011	015	015	018	020	022	025	030	038	
12100	5900	798	014	018	018	018	020	024	026	039	050	
12600	6300	799	011	020	020	020	020	021	023	030	035	
12100	6700	800	004	011	014	017	020	024	026	039	050	
AVERAGE CI AT EACH DEPTH			009	013	014	015	017	020	022	029	039	

PENETROMETER DATA

28 MAR 69 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1732 TO 1736 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS STATION			CONE INDEX READINGS AT DEPTHS IN CENTIMETERS									
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
11200	3900	801	023	023	023	023	023	023	025	054	100	
11500	3600	802	010	014	015	016	018	020	022	038	100	
12100	3900	803	007	009	010	010	010	010	011	050	100	
11500	4200	804	007	015	015	015	015	019	023	032	098	
AVERAGE CI AT EACH DEPTH			012	015	016	016	017	018	020	044	100	

PENETROMETER DATA

2 APR 69 RANGE 72 LINE NO. 161/162
 DATA COLLECTED FROM 1158 TO 1204 HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE
 POSITION IN CENTIMETERS STATION CONE INDEX READINGS AT DEPTHS IN CENTIMETERS

X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0
7400	8300	805	006	006	006	006	008	012	012	016	048
7700	7800	806	002	004	006	006	008	012	016	020	034
8300	8300	807	004	008	008	008	014	016	020	022	052
7700	8700	808	006	006	006	008	008	010	012	022	040
AVERAGE CI AT EACH DEPTH			005	006	007	007	010	013	015	020	044

PENETROMETER DATA

23 APR 69 RANGE 72 LINE NO. 161/162
 DATA COLLECTED FROM 1200 TO 1203 HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE
 POSITION IN CENTIMETERS STATION CONE INDEX READINGS AT DEPTHS IN CENTIMETERS

X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0
2300	5100	809	002	004	008	010	014	018	022	026	100
2500	4900	810	008	012	012	012	012	014	018	028	100
2700	5100	811	002	004	006	008	008	010	014	026	064
2500	5300	812	001	004	006	008	010	012	014	022	100
AVERAGE CI AT EACH DEPTH			003	006	008	010	011	014	017	026	091

PENETROMETER DATA

25 APR 69 RANGE 72 LINE NO. 161/162
 DATA COLLECTED FROM STATION NO. 813-823, 1757 TO 1826 HRS
 STATION NO. 824-840, 1413 TO 1459 HRS
 PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE
 POSITION IN CENTIMETERS STATION CONE INDEX READINGS AT DEPTHS IN CENTIMETERS

X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0
13900	4000	813	005	008	009	012	014	017	020	025	084
14200	3600	814	005	010	011	012	013	013	016	027	057
14600	4000	815	006	013	013	013	013	014	019	031	071
14200	4400	816	004	012	013	013	013	013	015	022	100
7600	4500	817	007	012	012	012	012	012	012	026	100
7400	4100	818	010	020	020	020	020	020	020	026	060
7800	4500	819	006	019	019	019	019	019	019	021	100
7400	4800	820	007	020	020	020	020	020	020	028	074
3000	1600	821	002	003	005	008	008	010	011	020	062
5000	1200	822	003	005	006	008	010	012	013	017	037
1100	1600	823	006	007	008	010	012	015	017	022	062
5000	2400	824	003	010	012	013	014	015	016	020	040
4400	7300	825	003	008	010	013	013	014	015	020	100
4700	7900	826	017	021	022	022	022	022	022	041	100
5000	7300	827	003	014	016	018	018	019	022	037	060
4700	7600	828	017	020	020	020	020	020	026	042	098
5000	7500	829	015	024	024	024	024	024	028	036	100
5200	7300	830	005	015	017	018	018	018	023	035	096
5700	7500	831	017	022	023	023	023	023	030	050	100
5200	7700	832	005	016	016	016	017	021	025	039	060
1200	4400	833	005	007	010	013	013	013	014	022	100
1500	4200	834	010	014	015	016	020	025	027	034	100
1900	4400	835	005	006	008	010	010	011	012	018	086
1500	4700	836	008	012	013	014	014	015	018	024	100
13400	4700	837	002	023	024	024	024	024	024	045	100
13700	4400	838	012	013	014	014	014	015	019	025	100
14100	4700	839	005	014	019	020	020	020	022	027	088
13700	5000	840	005	008	010	010	012	014	017	028	100
AVERAGE CI AT EACH DEPTH			008	013	015	016	016	017	019	029	083

PENETROMETER DATA

29 APR 63 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1721 TO 1802 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS					
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
5300	2900	841	007	011	011	011	011	013	016	025	037	
5600	2600	842	004	006	008	011	014	017	017	022	036	
6200	2900	843	005	012	012	012	012	015	018	023	037	
5600	3200	844	003	007	010	011	013	015	017	025	039	
4700	4000	845	006	010	013	014	015	017	019	024	052	
5000	3600	846	004	011	012	012	013	015	018	027	044	
5500	4000	847	010	013	018	019	021	024	030	043	062	
5000	4300	848	005	010	012	013	013	018	020	026	039	
4600	5000	849	003	010	012	013	016	017	020	024	054	
5000	4600	850	002	007	008	010	013	015	017	024	044	
5600	5000	851	003	013	014	013	015	015	018	030	054	
5000	5300	852	005	010	012	012	012	018	020	028	052	
5800	4100	853	003	012	014	015	016	017	020	025	054	
6100	3800	854	008	015	015	015	017	019	022	036	054	
6600	4100	855	002	006	009	010	012	013	015	020	030	
6100	4500	856	006	012	013	013	014	019	021	029	057	
9800	6100	857	004	011	011	011	011	011	013	020	038	
10300	5700	858	003	006	008	010	011	013	014	019	039	
10900	6100	859	006	010	011	011	012	013	015	021	033	
10300	6500	860	013	014	015	017	017	017	021	033	035	
AVERAGE CI AT EACH DEPTH			005	010	012	013	014	016	019	026	045	

PENETROMETER DATA

6 MAY 63 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1730 TO 1758 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS					
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
2300	3700	861	002	004	006	007	008	010	013	023	038	
2500	3400	862	003	007	009	011	013	017	018	027	042	
2800	3700	863	002	005	007	009	011	013	017	029	036	
2500	4000	864	002	004	005	007	009	012	015	025	034	
4200	3600	865	002	007	010	011	014	018	022	076	100	
4500	3400	866	001	005	009	011	014	019	022	032	090	
4900	3600	867	002	008	013	015	017	023	028	100	100	
4500	4000	868	002	005	007	008	009	011	013	021	037	
4400	3100	869	001	003	005	006	009	011	013	019	029	
4700	2700	870	001	002	004	005	006	008	010	016	023	
5000	3100	871	003	006	009	009	011	013	017	024	038	
4700	3300	872	002	005	007	010	014	017	022	033	100	
4800	1600	873	002	005	008	011	011	013	015	019	026	
5100	1200	874	002	003	007	009	011	013	017	024	039	
5600	1600	875	001	003	007	010	012	014	014	018	024	
5100	1900	876	002	006	007	009	012	013	015	020	028	
AVERAGE CI AT EACH DEPTH			002	005	008	009	011	014	017	032	049	

PENETROMETER DATA

23 MAY 63 RANGE 72 LINE NO. 161/162

DATA COLLECTED FROM 1510 TO 1517 HRS

PENETROMETER WITH 0-100 DIAL GAGE AND 3.22 SQ CM CONE

POSITION IN CENTIMETERS		STATION	CONE INDEX READINGS				AT DEPTHS IN CENTIMETERS					
X	Y	NO.	0.0	2.5	5.0	7.5	10.0	12.5	15.5	22.5	30.0	
9000	10000	877	002	004	006	008	010	012	014	022	100	
9300	09600	878	010	010	011	012	014	018	022	030	066	
9800	10000	879	004	008	010	011	014	016	018	024	100	
9300	10400	880	002	011	012	014	018	022	024	028	062	
AVERAGE CI AT EACH DEPTH			005	008	010	011	014	017	020	026	082	

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D		
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10. DISTRIBUTION STATEMENT Distribution limited to U. S. Government agencies only; this report documents environmental conditions under which experimental and/or conventional munitions were tested; distribution limitation applied April 1971. Other requests for this document must be referred to Air Force Armament Laboratory (DLRD), Eglin Air Force Base, Florida 32542.		
11. SUPPLEMENTARY NOTES Available in DDC		12. SPONSORING MILITARY ACTIVITY Air Force Armament Laboratory Air Force Systems Command Eglin Air Force Base, Florida 32542
13. ABSTRACT Test data was obtained by Environmental Characterization Working Group from two sand test sites to determine how selected environmental factors affect fuze functioning. The sand is described in terms of density, percentage moisture, and penetrometer readings, and each of these was evaluated to determine its variability. Regression analysis tests were performed to determine if a relationship existed between the variables. The variables were first paired by test site and were then combined to learn if one of the variables could be predicted by knowing another. Linear correlation of the variables was also evaluated. The data is based on a controlled environment and the results should not be applied to other environments.		

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14 KEY WORDS	LINK A		LINK B		LINK C	
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Effects of Sand on Munitions						
Soil Sample Analysis						
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